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AMERICAN
PHYSICAL EDUCATION REVIEW.

Vol. VI. MARCH, 1901. No. 1

PHYSICAL TRAINING IN THE SCHOOLS OF STOCKHOLM.

FRED EUGENE LEONARD,

Oberlin, Ohio.

The public schools of Sweden are commonly classified as follows: the primary, or *folkskolor;* the secondary, or *allmänna läroverk;* the universities and other superior and professional schools; and the technical schools. The first group does not lead up to the second, but a child is sent to one or the other of the two according to the means or ambition of his parents and their plans for his future career.

The *folksola* is designed to furnish that kind and degree of education which the state requires of every citizen irrespective of class or calling. Its course of seven years, covering the period of "school age" (7-14), includes religious instruction, a study of the mother tongue, arithmetic and simple geometrical construction, geography and history, the rudiments of physical and biological science, drawing, singing and gymnastics, to which are commonly added, as optional subjects, manual training and instruction in domestic economy. Tuition in all these branches is free.

The *läroverk,* corresponding in general to the German *Gymnasium* and the *French Lycee*, gives a broader training intended to prepare for later study at the universities and the professional and higher technical schools, or to meet the conditions for admission to any but the lowest grades of government employ. In order to enter one must be at least nine years old, and the average age of those who receive their "certificate of maturity" upon com-

pleting the full nine-years' course is between 19 and 20. To a more extended study of the subjects taught in the *folkskola* are added German and French, for all students, and together with these languages either English, or Latin and English, or Latin and Greek, depending upon whether the pupil pursues the "modern course" (*reallinie*) or one or the other of the two sections into which the "Latin course" (*latinlinie*) is divided. An American college student at the end of his sophomore year has received an education roughly equivalent to that of a graduate from the Swedish *läroverk*. Each pupil is expected to pay a fee of ten crowns ($2.70) upon admission, and about thirty crowns a year thereafter; but provision is made for relieving indigent and worthy scholars from even this nominal charge.

PRIMARY SCHOOLS.

Of the more than 35,000 children of school age in Stockholm last fall, 25,613, or over three-fourths, were attending the thirty *folkskolor*. These are grouped in eight school systems, corresponding to the parishes or districts into which the city is divided, and at the head of every such system is placed a so-called First Teacher. The different grades in a single building are cut up into parallel sections, so that the average number of children under one teacher does not exceed 35. Thus the three schoolhouses of Katarina district contained altogether in 1899 some 4,800 pupils distributed among 138 classes, Maria district, with the same number of buildings, had 4,000 in 112 classes, and Klara district 1,400 in four buildings and 40 classes.

The great Kungsholms folkskola, intended to accommodate 3,500-4,000 children, and said to be the largest school building in the world, is in many ways typical of them all. Its size is unusual, to be sure, but the major part was completed only last year, so that it doubtless represents the latest ideas in school architecture. The building consists of two L-shaped portions, each four stories high with a basement, their long arms forming the opposite ends of a rectangular graveled yard and separating this from the street, and their short arms turned toward each other on one side of the yard. At the centre of this third side is an archway, flanked by one-story structures which contain offices and the janitor's quarters. Next to these the loftier gymnastic halls complete the front by joining on to the ells. The area of the yard is not far from one and a half acres. The long

wings on Flemming-Gatan and Kungsholms-Gatan measure 285 feet in length, the entire front on Mariebergs-Gatan 360 feet, and the depth of the ells between street and yard is everywhere about 40 feet. The class-rooms, 94 in number, occupy the entire street side of the building, and open into long corridors which look out upon the central yard and lead down into it. On every floor drinking fountains and stationary wash-bowls supplied with hot and cold water are distributed at frequent intervals along these passage-ways. Besides the recitation rooms there are eight larger halls for pasteboard, wood and metal sloyd and the sewing classes; three rooms to be fitted up as cooking schools; two gymnasia; two bathing outfits, which include dressing-rooms, a hot-air chamber, shower baths and a pool 14x7 feet; steam disinfection apparatus, laundry and drying-rooms; dining-rooms, and counters where milk and bread are sold to the children; the living apartments of the first teacher, and a room for the use of other teachers; offices, and janitor's quarters. The old wing is heated by steam and the newer one by hot air. The total cost, exclusive of the site, was over $200,000.

In the class-rooms of this building the single desks are arranged one behind the other, so as to leave aisles between adjacent rows and next to the wall at the sides and rear. Space is thus afforded for simple marching exercises and for others which either require no apparatus or may be practised with the help of desks and seats. The two halls set apart for gymnastics measure about 55x25 feet, and have a height considerably greater than that of the other rooms. Their side walls are lined with stallbars, and the floor space is divided crosswise into three nearly equal parts by two pairs of booms, when these are set up. But the bars and central post of each pair can be dropped below the floor, and then the entire area from wall to wall is left free. The remaining equipment includes Swedish ladders, climbing poles, ropes and rope-ladders hanging from the ceiling, long benches for use at the stallbars, and bucks for vaulting exercises. Each of the other school districts has also its special room or rooms for gymnastic instruction.

The three lower classes of the various folkskolor have marching and other exercises without apparatus daily, in the schoolroom, the work alternating with other instruction and directed by the same teacher. In the case of higher classes special periods, three a week as a rule, are set apart for the gymnastic lesson, and this is given sometimes in the schoolroom, utilizing the desks and

seats as apparatus, but at least once a week in the gymnasium, where its duration is commonly about half an hour. Little or no change of costume is attempted, beyond the laying off of coats by the boys. The school report for 1899 relates that "since many of the children wear wooden shoes, unsuitable for the gymnastic lesson, 400 pairs of special shoes were bought and distributed among the districts for use in the gymnasia."

As regards *teachers* in the folkskolor, the women out-number the men five to one. All must have completed a four-years' course at one of the 12 Swedish normal schools for this grade of instructors, and of that course gymnastics everywhere forms a part, directed by a graduate of the Central Institute at Stockholm and occupying three hours a week throughout the entire four years. There is always a model school attached, which affords the future teacher an opportunity to test his skill and to acquire experience in this as well as other branches of instruction. In Stockholm teachers receive additional counsel and direction from a special instructor in gymnastics, who divides his time among all the folkskolor in the different districts; but the general guide followed is Liedbeck's manual of gymnastics.* Besides the formal exercises this book contains a large number of games. These are introduced occasionally as part of the gymnastic lesson, and are also encouraged in the school-yards during recess. Of its 28 tables of exercises only six call for no paratus of any sort, six can be given with nothing more than desks and seats, and the balance require a gymnastic hall supplied with stallbars, booms, poles, ropes, ladders, benches, mats, etc.

Instruction in *military tactics* and target shooting is given to the older boys in the spring and early fall, under the general direction of an army officer who is assigned to this service in all the primary schools of the city. There is drill by squads in exercises for the recruit, together with occasional company drill, a few longer marches in battalion, and training as subalterns for the most advanced.

Some other features of the Stockholm folkskolor deserve mention here, inasmuch as they bear upon the health or form a part of the physical training of the children. The *school hours* are

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*Gymnastiska Dagöfningar för Folkskolan. C. H. Liedbeck. 2d Ed., Stockholm. 1891. 9¼ x 7¼ in., pp. 107. 297 figures in the text, and 4 folding plates at the end illustrating equipment.

from 8 until 1 o'clock, beginning a quarter or half hour later, however, in the dark winter months. A 30-minute recess follows the second lesson period, and there are three more of 10 minutes each, so that the actual time for study and recitation is reduced to four hours. Work continues throughout the six week-days, and for 39 weeks of the year. When lack of room renders necessary the organization of other divisions meeting in the afternoon the hours for these are from 2 till 6 o'clock, with one recess of 20 minutes' duration and two others of 10 minutes each.

Especially attractive and interesting to the visitor are the progressive courses in *manual training* (sloyd, Swedish *slöjd*), which are introduced because of their educational value, rather than to serve the purpose of technical training proper. For boys such work is optional and comes after school hours, except in the highest classes. There it is included as a necessary part of the morning programme, and four hours a week are required of each pupil. Pasteboard and wood sloyd were taught in each of the 8 districts in 1899, and metal sloyd in 4, as a rule by teachers who gave instruction in other school subjects besides. In these courses there were respectively 2,272, 2,791 and 650 boys, whose ages averaged 10.5, 12.2 and 12.8 years. For the girls and younger boys there is systematic instruction in sewing, the complete graded course extending through the 7 years and requiring 2 hours a week in the lowest class, 4 hours in the next 3, and 5 hours in the rest. There are special teachers for the higher division of girls.

Six of the districts possessed in 1899 completely equipped *cooking schools,* where 1,165 girls spent about 15 days each during the year. Those in attendance for the day are grouped at the different stoves, every member with her special duty to perform. The teacher first explains what is to be done, giving weights and measuresof ingredients and their prices, discussing food values, and describing and illustrating methods. Some attempt is also made to teach such book-keeping as the housewife needs to know. Then the pupils proceed to prepare and serve the simple meal, doing all the work necessary in a kitchen except the heavier cleaning. The products of their culinary skill furnish their own dinner, and also that of some hundreds of poor children, who pay for it little or nothing. Pupils whose parents are unable to supply them with suitable nourishment are otherwise provided for at some of the public schools, receiving there a dinner every second day. The number in 1899 was 60 for one district, 240 in another and as high as 400 in a third.

School baths are found in all but two of the districts. The commonest form is the so-called Finnish bath, which consists of sweating-room, shower-baths and a small pool; but in two cases there is nothing more than a series of tubs, each with a douche overhead. Every child is given an opportunity to bathe once in three or four weeks as a rule. The number of baths actually taken in 1899 was 80,000, and the average to each pupil ranged from 3 in one district to 7 or 8 in another. In connection with some of the school baths there is an outfit for disinfecting clothing by means of steam, in cases of skin or contagious diseases or general uncleanliness. The operation is completed while the child is in the bath. During the summer months pupils have further opportunity for bathing, and may also receive instruction in swimming, at a large swimming school in Lake Mälaren, near one of the city bridges. Over 3,000 boys and 2,500 girls availed themselves of this privilege in 1899, and a total of 6,000 in 1900. The number of those who could swim increased in the former year from 602 at the beginning of the season to 1,510 at its close.

Another feature of hygienic interest is the *summer colonies* of feeble or sickly poor children, sent out into the country or to the mountains. There were 25 such colonies in 1899, including 320 boys and 328 girls, whose ages ranged between 7 and 14 years in all but a few cases. The average duration of the outings was something over two months, and the cost per child ten dollars.

Finally, the city has arranged with a number of *physicians* to examine into the condition of all the children of certain grades, and of such special cases as are referred to them by teachers on account of general weakness or suspected disease. Besides shedding light on important questions of development and general school hygiene this measure has prevented or checked the spread of contagious diseases in some of the schools, and secured proper treatment to many pupils in ill-health, who have been sent to hospitals, clinics, and district or private physicians, as the case demanded. Others have been required to diminish the amount of their school work, or to discontinue it altogether for a time.

SECONDARY SCHOOL FOR BOYS.

These are further divided into two groups,—the higher (högre allmänna läroverk), which have a course of study extending through nine years, and the lower (lägre allmänna laroverk),

with one of five years only. The number of pupils in attendance at each during the spring semester of 1900 was as follows:

Higher—		
Norra Latinläroverk	758	
Realläroverk	598	
Södra läroverk	595	
Nya Elementarskola	351	
	——	2,302
Lower—		
Jakobs läroverk (spring of 1899)	284	
Katarina "	267	
Östermalms "	408	
	——	959
		3,261

With few exceptions the ages range between 9 and 19 years in the higher läroverk, and between 9 and 15 or 16 in the lower. The school year is divided into a fall semester of 16 weeks, beginning near the end of August, and a spring semester of 20 weeks, lasting from the middle of January to the early part of June. Various holidays reduce the actual total to about 34½ weeks. The number of hours per week of six days varies from 27 in the lowest class to 30, 31 and 32 in the higher ones, to which must be added two hours of instruction in singing and three hours of gymnastics.

The Latinläroverk occupies a rectangular building 225 x 100 feet and three stories high with basement, completed in 1880 at a cost of $225,000, the value of the site not included. Its great yard contains more than three acres of space available for games and other exercises. The gymnasium has a height of two stories, and is situated on the ground floor of a wing which projects from the rear of the main building. Its central fire area measures about 75 x 60 feet. This is continued at one end into a semicircular bay and at the other under a deep gallery, and is separated by three pillars on either side from aisles of equal height and length, but only about 9 feet in width. Great windows at the sides and free end give abundant light. The other end communicates with passage-ways, an office for the teacher, and dressing-rooms, where each boy is assigned a coat-hook, shelf and pigeon-holes for books and shoes.

The Realläroverk possesses a main building with a chief

façade 250 feet in length, completed in 1890 at a cost of $210,-000. That of the Södra läroverk, resembling it in dimensions and general plan, cost $245,000 and was opened the following year. At both schools the gymnasium is a separate structure of brick, located at one side of a gravelled yard at least 1½ acres in extent. Each cost about $17,000, and consists of a lofty main hall 80 x 40 or 45 feet, to which is attached a lower portion containing dressing-rooms, the teacher's office and a few shower-baths.

The old buildings of the Nya Elementarskola have been remodeled and extended in the last two years. Although it is located in the centre of the city, the area of its yard is between a third and half an acre. This school and the Jakobs läroverk have no gymnasia of their own, but the pupils of both visit the neighboring Gymnastic Central Institute for that part of their instruction. In the case of Katarina and Östermalms läroverk the gymnasium is a hall in the main building. At the former it is a room 95 x 55 feet and 30 feet high, and the school playground covers a quarter of an acre.

The following list of apparatus noticed in the gymnasium of the Realläroverk is given for purposes of comparison: 60 sections of stallbars, 7 booms, 2 vertical Swedish ladders and 2 horizontal ones, 8 rope ladders, 24 climbing ropes and 8 poles, 2 double inclined ropes, a few sections of stallbars continued to the ceiling as ladders, storming boards and short benches for use with stallbars, bar saddles, 2 Swedish horses, 2 vaulting boxes, 2 bucks, jump stands with cord and pins, some thin mats about 4 x 3 feet, and a number of cheap foils. The booms are arranged in the manner already described in speaking of the Gymnastic Central Institute (this Review for December, 1900, p. 307). The inclined ropes are attached to the ceiling at either end, and to a hook beneath the floor, when in use, by means of a tackle block at the centre. Near the ends they are crossed by vertical ropes, used by the pupils in reaching or leaving the inclined ropes. All of these ropes can be hoisted out of the way readily, and a small trap-door conceals the hook.

The Södra läroverk differs in having few sections of stallbars (only 36), 2 more vertical Swedish ladders, 2 peg-posts, and a half-dozen jumping boards. The equipment at the Latinläroverk is newer and presents some improvements, such as balanced bars for the booms which have fixed posts at both ends. The number of stallbar sections, booms and oblique ropes

is greater, some of the short benches are replaced by long ones with balancing beams on the under side, and there is a peak ladder which can be raised and lowered. Long jumping ropes were seen here, and are doubtless in use elsewhere. One of the three halls in which pupils of the Nya Elementarskola and Jakobs läroverk receive their instruction at the Gymnastic Central Institute was described in the REVIEW for December, 1900 (p. 306).

The royal statutes require that in every public secondary school in Sweden there shall be at least three hours a week of pedagogical gymnastics, arranged in daily half-hour periods when possible. In Stockholm the division into half-hour lessons is the most common one. Less frequently there are three periods of an hour each, and in a few cases a class meets twice for a half hour and twice for an hour, or 50 minutes four times a week, or 40 minutes six times, or in four one-hour periods. In a majority of cases the time chosen for the exercise lies between 10 and 1 o'clock, though the hours from 2 to 4 in the afternoon are also used not infrequently. Military exercises take the place of gymnastics for boys of the 6th-9th years in the early part of every fall semester, occupying three hours daily for 20 days as a rule, and during this period their usual school duties are cut down to a corresponding amount.

Each of the seven schools has its special teacher of gymnastics, and no one is eligible to such a position until he has completed the work of the first and second year courses at the Gymnastic Central Institute. At the present time these teachers and their assistants are all officers in the army, and five of the nine are on the staff of instruction at the Institute. One has the rank of major, and the rest are captains and lieutenants.

Occasionally a so-called "weak section" is formed from the whole or part of a school, but in general the division into classes is based upon school grade, the boys of the 6th-9th years exercising together as a rule, and the rest variously subdivided according to their numbers. The size of some of these classes is noteworthy. They rarely contain fewer than 60 or 70, while 100-125 is not an unusual number, and 150-200 are sometimes seen together under a single teacher. To facilitate the handling of so many it is usual to separate them into squads of 12, 15 or 20, on the basis of physical fitness, and to place at the head of each squad one of the best pupils, who sees that his portion of the lines is correctly formed at the beginning of the hour, re-

ports upon attendance, and directs the work of his division when the teacher is not giving commands for the whole class. This last office of the squad leaders is discharged by first year students at the Gymnastic Central Institute in the case of classes meeting there.

Before exercising it is the practice to remove coats, collars, cuffs and suspenders, and the dickey, or detachable shirt front, if a boy has arrived at the dignity of wearing that common article of clothing. Shoes are exchanged for rubber-soled canvas slippers, of the sort so often seen in America.

The arrangement of exercises in a lesson period follows in general the "day's order";* but the application of this is found to vary considerably in different cases, depending upon such circumstances as the age of pupils, size of class, length of period, and kind and amount of apparatus at hand. In what may be taken as a typical lesson the entire class is first formed in one or two double lines down the room, each squad in its place and with its leader standing in front to hasten and correct the formation and to note any absences. The ranks are now opened into four or more lines and the teacher commands a series of simple introductory exercises which call for moderate activity and co-ordination of legs, arms and trunk, and are executed without apparatus. This part of the lesson commonly lasts only a few minutes. An arch flexion at the stallbars follows, and the class then breaks up into squads for the first heaving or climbing exercise performed on boom, ropes, poles, ladders or stallbars. If the balance exercises call for apparatus they may be done by each pupil as he finishes the heaving movement. Otherwise they are given after the class is reformed, and are succeeded by shoulder blade, abdominal and lateral trunk exercises under the teacher's immediate command, sometimes with the aid of apparatus and sometimes without. It is the custom to introduce a short run before the squads again separate for a second heaving or climbing exercise and for the jumping and vaulting which follow. Afterwards they are reunited for a few quieting exercises, the ranks are closed as at the start, and the pupils leave the room by squads, or break up informally after they have responded in chorus to the teacher's final "good morning."

A few of the various modifications observed are mentioned here. In one half-hour class of a hundred small boys the first

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* See p. 307 of this REVIEW for December, 1900.

15 minutes were taken up with free exercises, which formed a small "day's order" by themselves, including leg exercises, arch flexion, arm extensions, balance movements, lateral trunk exercises and jumping. After this the squad leaders took their charges for a variety of heaving, climbing, jumping and vaulting exercises, involving several quick changes of apparatus. At the close of respiratory exercises by the class as a whole each rear rank boy suddenly sprang on the back of the one in front of him and was hurried into the dressing-room. In other classes fencing or a game took the place of the lateral trunk or second heaving movement, or of both these groups, and not infrequently certain groups of exercises were omitted altogether. With classes which meet at the Gymnastic Central Institute the usual method is for the squads to work separately under a first year student, except during the introductory exercises and the marching and running which follow the lateral trunk movements. At the Latinläroverk and Realläroverk the squad leaders learn from a glance at written schedules on the wall what particular apparatus and exercises they are to use on a given day, and these tabular statements are renewed from time to time by the teacher.

The ease and quickness with which apparatus is made ready or put out of the way by pupils must strike every observer. It is this which allows such frequent changes during a single lesson, and the great variety of forms given to the "day's order." Much of the teaching seen was remarkably well done. Perfect discipline and prompt and accurate execution of commands were secured, and yet there was no oppressive military strictness nor anything but the pleasantest relations between teacher and pupils. Opportunities for relaxed attention and brief outbreaks of high spirits were frequent, the boys took hold with a vigor which proved their interest, and many squad leaders, even the youngest, showed uncommon earnestness and ability to direct. In a few cases the control over a class was less perfect, and listless, slovenly execution was allowed. Where pupils are sent to the Gymnastic Central Institute for their instruction, and receive it largely from students at that school, the frequent change of leaders and the great variety of personality among them produce a natural mingling of good and bad teaching. If one set of persons is counted upon to supply experience to another the two are not likely to profit equally from the arrangement, however necessary and well ordered it may be.

So far as the fencing instruction given to boys of the four

higher grades was observed it formed a portion of the gymnastic lesson, and included brief practice in the fundamental positions and movements by the whole class, and an exchange of thrusts and parries between two opposing lines. It was of course elementary in character, and the large numbers and short time seemed to prevent much in the way of results. The military exercises of the same boys in the fall semester cover target practice with the rifle, besides squad and company drill and the manual of arms. The school yard serves not only for these evolutions and for games, but part or all of the regular gymnastic lesson is often given out-of-doors when the weather is favorable. As regards sloyd, the Latinläroverk stands alone in affording opportunity for such instruction to its pupils. Last year 40 of them elected the course in the spring semester, and 22 others came from the Realläroverk for the same purpose.

It remains to mention the school physician attached to each one of the seven institutions. He assists in securing hygienic surroundings of school life, and has a general oversight of the physical condition of pupils. For the rector's annual printed report he supplies tabular statements covering these items for each school grade: average age, weight and height of pupils; number suffering from anemia and from frequent headache and nose-bleed, number of cases of deafness, and of near-sightedness less than 3 D., between 3 and 6 D., and over 6 D.; number, duration and outcome (if fatal) of cases of illness, the different infectious diseases by themselves and the others grouped together under the headings "ear, eye, respiratory, digestive, nervous," etc. Statistics for the fall and the spring semester are given separately. In some of the reports for 1899-1900 the items of height and weight are omitted.

SECONDARY SCHOOLS FOR GIRLS.

In all Sweden there are only two higher schools for girls under public control. These are the Stockholm Higher Seminary for Teachers (Kungl. Högre Lärarinneseminarium), and the "Normalskola," which is associated with it as a model school and to furnish practice for its students. One of the halls in the school building used by the two in common is fitted up as a gymnasium, and except in the case of the lowest classes at the Normalskola a half-hour of gymnastic instruction is given daily throughout the entire course of study at both institutions.

PRIVATE SCHOOLS.

The great majority of these are for girls only, or admit boys to none but the lower classes. There is no law prescribing the amount of physical training to be given in them and the practice varies accordingly. Thus in 1899 there were 46 such schools, with a total of 5,157 pupils, and out of this number 2,909, in 33 schools, were reported as receiving instruction in gymnastics. The oldest institution of them all, with 240 pupils, has nothing but a small room some 40 x 25 feet and 9 feet high, supplied with a boom, 6 climbing ropes, 3 long benches with balancing beams on the under side, a vaulting box, jump stands, and a rubber ball. Most of the lower classes exercise here for half an hour every other day, and the higher ones half an hour twice a week, under a special teacher. Another school for girls provides for nearly the same number of pupils a room 60 x 20 feet and of good height, situated on the ground floor, and for its size as well equipped with apparatus as any of the boys' schools mentioned. Its gymnastic instruction is in the hands of Major Silow, of the Central Institute, assisted by students in the course for women at that school. His capacity as an organizer and rare talent as a teacher render the quality of work done by pupils here quite as good as the best seen anywhere in Stockholm.

Berlin, February 11, 1901.

CREDIT FOR PHYSICAL EXERCISE.

PAUL C. PHILLIPS,
Amherst College.

At a meeting of the Society of College Gymnasium Directors held in December, 1898, as the result of a paper presented by Dr. W. A. Lambeth of the University of Virginia, a committee was appointed to formulate an outline of the course of study and exercise for a *department* of Physical Education, which should be commensurate with that of other departments in a college or university curriculum. This committee consisted of Dr. Lambeth, chairman, Dr. James A. Babbitt, of Haverford College, and the writer. At the next annual meeting, December, '99, the committee was continued, and there were added to it Dr. Caspar Miller, of the University of Pennsylvania, and Dr. R. Tait McKenzie, of Magill University. At the 1900 meeting permission was given and the writer was requested to send this partial report of the committee to an early number of the PHYSICAL EDUCATION REVIEW.

In February, 1900, as a member of this committee specially interested in one part of its field—credit for physical exercise—with the consent of the other members, I sent out the following questionnaire:

AMHERST COLLEGE, DEPARTMENT OF HYGIENE AND PHYSICAL EDUCATION.

Amherst, Mass., Feb. 28, 1900.

Dear Sir—The following questions are asked by a member of the committee, appointed by the Society of College Physical Directors in December, 1898, to report on "Credit for Physical Education in a College Course." This committee is still at work. It is hoped that you will assist them in ascertaining the precise status of Physical Education in College curricula today in order to obtain a more intelligent report of proposals for the future.

All communications, if so desired, will be considered confidential.

An early and accurate reply will be greatly appreciated.

Yours very truly,
PAUL C. PHILLIPS.

Name of Institution? What equipment have you for Physical Education? Is Physical Education established as a department? Is Physical Exercise required of the students? How long has the requirement been in force? For how many years of the course is Physical Exercise required? How many weeks per year? How many times per week? How long are the periods for each exercise? What is the character of the required exercise? What is embraced in the whole course of required work (i.e. of calisthenics, heavy gymnastics, games, athletics, combative exercises, etc., etc.)? What constitutes a valid excuse from this work? By what means are regular attendance and good work attained? Is an elective in Physical exercise given? For what classes? Of what character is the work? Is a uniform suit required? Of what does it consist? Is credit given to Physical Exercise in the scholarship standing of the students? How much? (Please state definitelv and in terms which may be reduced to percentage of the entire credit for the college course.) On what do you base the standing of students in Physical Exercise (state per cent. given for attendance, deportment, application, proficiency, etc.)? Does the work in Physical Education have to be done satisfactorily bv a student in order to obtain a degree? Does the credit system improve the work done? Does it aid in the discipline of the classes? Is the system satisfactory to Faculty? Physical Director? Students? What changes would you suggest?

REMARKS.

(*Name of Director?*)

This list of questions was sent to all institutions of higher learning, whether for men, women, or co-educational, where there seemed any likelihood that Physical Education had become established: 269 in all. The results of the answers which bear on credit and requirement are given below.

Table I. Of the Colleges doing Organized Work, having Requirement and giving Credit:

	269	Blanks sent out.
	109	Replies.
8		No equipment and no work.
3		Equipment, but no work.
—	11	
	98	Doing organized work.
	28	Equipment and work, but not a department.
	—	
	70	Doing organized work and with departments.

	98	Doing organized work.
	26	Not requiring physical exercise.
	72	Requiring physical exercise.
7		Women's colleges.
2		Coeducational institutions where it is not required for the men.
	9	
	63	Men's colleges requiring physical exercise.
	39	Of these 63 give no credit for physical exercise.
	24	Give credit.
3		Give negative credit.
21		Give absolute credit.

From Table I. will be seen that 109 replies were received. These embraced almost all the larger colleges and universities. Eight of them reported no equipment and no work; three, some equipment but no organized work.

Of the 98 remaining which were doing an organized work 23 reported no department of physical education; 4 gave no reply and 1 reported practically none: 28 in all. *This leaves at least 70 colleges and universities of all kinds out of 109, or 64 per cent., where the work is established as a department of college.*

Of these same 98 institutions 25 (22 men's and 3 women's colleges) reported no requirement of physical exercise and one made no answer, leaving *72 or 66 per cent. where a requirement of physical exercise is in force.*

Of these 72, 7 are women's colleges and 5 are coeducational institutions, in 2 of which there is no requirement for the men. *There are thus 63 institutions for men, including 3 co-educational ones that today, for a greater or less period, require physical exercise. This is 62 per cent. of all the men's colleges which reported.*

Of these 63 requiring physical exercise, 21 report that credit is given for it in the scholarship standing of the students; 3 report a negative credit, i.e., the students are graded and their standing is considered in recommending them for a diploma, but it does not actually modify the diploma grade. *Thus one-third of all the men's colleges requiring physical exercise, or one-fifth of all reporting, give absolute credit on the diploma for physical exercise.* Six of these 21 are New England colleges of high standing, and most of the rest are from the Middle States, while a few are large western universities.

In some of them this recognition has been in vogue several, in 2 as many as 12, years. In but one has the director anything but unqualified praise for it, and in none is there noted any objection on the part of faculty or students.

TABLE II. Of the Number of years the Requirement of Physical Exercise has been in Force:

Number of Years....	1	2	3	4	5	6	7	8	9	10	11	13	15	41	Not Known
Number of Colleges..	11	5	8	2	8	3	2	7	3	1	1	2	4	1	5

Total, 63

TABLE III. Of the Number of Years of the Course during which Physical Exercise is Required:

Number of Years....	1	2	3	4	8
Number of Colleges..	10	24	7	21	1

Total, 63

TABLE IV. Of the Number of Weeks per Year that Physical Exercise is Required:

Number of Weeks....	11	12	13	14	15	16	18	20	22	23	24	25	26	28	30	32	33	35	36	37	38	40	College Year
Number of Colleges..	1	5	1	2	2	1	2	7	1	3	2	4	1	2	5	1	1	1	6	1	3	2	9

Total, 63

TABLE V. Of the Number of Times per Week that Physical Exercise is Required:

Times per Week......	1	2	2½	3	4	5
Number of Colleges..	2	23	1	23½	12½	1

Total, 63

TABLE VI. Of the Length of each Period of Physical Exercise:

Number of Minutes..	30	40	*45	*50	*55	*60	*60—Dressing Time
Number of Colleges..	10	7	12	2	1	24	3

Total, 63

* Probably about the same actual time.

The *amount of credit* which is given and its relation to that of other departments form two separate considerations. The gross amount varies from 1-90 to 1-8 of the entire diploma mark, being determined largely by the amount of the requirement of exercise. This varies greatly, as may be seen in Tables III., IV. and V., from 12 exercises for the college course to 140.

As regards *relative value* most of the 21 institutions put it on the basis of laboratory work, i.e., 2 hours a week credit for a 4-hour course. One marks it one hour for three and a few even here put it on the same plane as other departments and give it full credit, hour for hour. Where an elective is given with some theory, as at Yale to upper classmen, and at Leland Stanford naturally full credit is given.

These figures need no comment. They are significant of the position which physical education holds in our colleges at the conclusion of less than a half century of existence.

The committee to which we have already referred has not made its final report, and what follows comes with but individual and not official force.

The increasing attention which has been paid in late years to the education of the body, as it is called, the recent results of scientific investigation, the practical application of the theories deduced to the growing child and man all have worked toward the obliteration of the old line of demarcation between physical and mental education. President Eliot, at the meeting of the A. A. A. P. E. in '99, said: "The measure which seems to me best calculated to secure a dignified and influential place for 'physical training' in that sense is to get rid of the word 'physical' altogether." The sooner educators recognize and apply this idea, that the development of the physical is inextricably interwoven with that of the mental the better for all education. That many of our colleges do so is evidenced by the figures we have adduced. In educational value exercise, however, even in the giving of credit, is not yet classed as equal to other studies for students of college age. The hygienic is added thereto and the total valuation raised. When the value of sense training, motor training, the development of physical and moral courage, and the strengthening of the will are considered together with the hygienic utility to the college student it seems to us that the 21 institutions which give credit are on safe ground. The union of the so-called physical with the mental factors on a college diploma will not be a shocking mésalliance even to puritan intellects.

Credit is the logical sequence of required exercise. (And for a requirement in most colleges no plea is needed. 72 college faculties have not followed the lead of 40 years ago like sheep over a wall.) What other department would face the proposition of requiring, say 400 men to come to class four times a week 35 weeks in the year and four years in the course, with no credit to give them for good work, except an occasional prize! It is argued that the desire for their own physical development is sufficient—as that for mental is not elsewhere. If that is true then they need no requirement. The motive of self-improvement lasts for a while, but instructors find that, vary exercises as they will, as elsewhere it eventually fails. We hope not to be branded as pessimists for thinking that we have not yet passed the era of marks of some kind for students of college age.

A negative credit is insufficient, though good as far as it goes. It is, however, in the nature of a threat rather than an incentive to something more than minimum work.

The proposition is evidently equally difficult for the student. Why should he work without such incentive here, as elsewhere?

Some may aver that the work may be made sufficiently attractive to need no further incentive. Experience does not, in most cases, support this view. For short periods it may do so, or where great latitude is allowed in the student's selection, but not for a course of work.

A common-sense basis of marking, giving large importance to attendance, the spirit manifested and relative rather than actual attainment will not put a dull gymnast on the commencement stage nor keep the othewise brilliant student from it.

The results of the credit system in these 21 colleges and universities seem to show that it has added a dignity to the department of physical education which has helped to make it worthy the best efforts of an educated director. That it has helped to remove from the student the idea that the gymnasium and athletic field were greater than the one who conceived them. That it has made the department seem worthy the dignity of the college.

NOTE.—It is hoped that this article will be acceptable as an answer to the numerous enquirers for the results of the questionaire, whom I hereby desire to thank most heartily for their cordial coöperation. P. C. P.

A PRELIMINARY STUDY OF PUPILS' ATTITUDES.*

LILLIAN M. TOWNE,

Boston Normal School.

The object of the Section work as outlined at the time of its inception, was to formulate methods of observation and experiment that would be of use from the point of view of Physical Training and to carry on investigation when possible.

Accordingly, at our first meeting, last March, it was decided that a study should be made of the positions taken by school-children, when no incentive for good posture was presented. Not only members of the Section, but many public school teachers as well, began to observe the positions taken by pupils in various recitations, so that by June first, seventy-two reports relating to about 3,500 pupils from the primary, the grammar and the high school grades were in the hands of the committee. Many interesting points connected with school-life were revealed by these reports. Thus, foot-stools, when provided, were frequently not used at all by the children. Again, dissimilarities between the positions assumed by boys and by girls became evident. Moreover, a study of the reports showed that one pupil might have been classed under two or more faulty positions. Hence, it was suggested that the study of "Positions" be the work of the Section in the fall.

For this later work printed blanks containing a list of faulty positions and the following points of inquiry were provided:

Grade—Number of pupils? Boys? Girls?

Seats—Adjustable? Non-adjustable? Frequency of adjustment? Sizes?

Crickets—Provided? Used? Not provided? Not used?

Windows—Left? Right? Back? Front?

Recitation or Study Period—Kind? Length? Time of day? Kind of day?

But the teachers, after answering the general points, found

* Report of the Public School Section of the Boston Physical Education Society, December 13, 1900.

the use of the blanks more difficult than the plotting of the positions of the pupils according to the plan of the room, as is indicated below:

BOYS.	GIRLS.	BOYS.	GIRLS.
Feet braced against left iron of desk. Sliding down in chair.	Shoulders forward. Chest flat. Leaning on both elbows.	Right knee in desk. Left foot braced against right iron of desk.	Shoulders twisted. Leaning on left elbow. Left leg crossed over right.

This plotting of the positions has been generally managed in one of two ways. The teacher has noted the positions, while the pupils have been engaged in work, or another person has noted the positions, the teacher meanwhile being engaged in teaching or in guiding the work of the class.

During the exercise nothing was to be said about position. Hence, in many cases, more than a transitory position of the body has been indicated. Yet in others, the positions have changed, so that the question has arisen as to whether one faulty position may or may not be followed by a counteracting one.

On November twenty-eighth it was found that 2,302 primary and grammar pupils had been reported upon, while several helpful reports had come from high and normal schools. The reports were then arranged in grades: Grade I, the lowest primary (age about five years); Grade II; Grade III, the highest primary (age seven or eight years); Grade IV, lowest grammar (age eight or nine years); Grade V; Grade VI; Grade VII; Grade VIII; Grade IX, highest grammar (age fourteen or fifteen years).

Each report was then examined to see if it were accurate. If not, it was discarded. Moreover, in selecting the report, the aim was to have an approximately equal number of boys and girls for each grade,—thus Grade IV furnished 89 boys and 93 girls; Grade VIII, 96 boys and 89 girls.

Hence the following tabulation is based upon 757 boys and 727 girls, a total of 1,484 primary and grammar pupils. Again, the reports were selected as far as possible, not only from widely separated parts of Boston, but from places outside as well. Thus, the reports upon position for one grade might include boys and girls from Bridgewater, boys from East Boston and girls from Waltham. So, with widely different environment, any common positions would seem to indicate a tendency connected with school-life.

The next step was to tabulate all the faulty positions for each

grade, and the number of cases under each position, so that at the completion of the tabulation, it seemed as if there were an endless mass of positions on hand that could mean very little to anyone. But the next suggestion was to classify all these positions according to their dominant factor. The result was the arrangement indicated in Table I. Upon this table was then placed the number of the various positions for each grade.

TABLE I.

I. Correct or excellent position.
II. Front positions.
  1. Erect.
    a. Feet braced back.
    b. Feet crossed and braced back.
    c. Feet unevenly braced.
    d. Feet crossed front.
    e. Feet in aisle.
    f. Feet in aisle, leaning on elbow.
    g. Feet in desk irons.
    h. Feet in one desk iron.
    i. Foot in one iron, leaning on one elbow.
    j. Knees in desk.
    k. One knee in desk.
    l. Legs crossed.
    m. Legs crossed, one foot in desk iron.
    n. Legs crossed, leaning on one elbow.
    o. Sitting on both feet.
    p. Sitting on one foot.
    q. Sitting on one foot, leaning on one elbow.
    r. Sitting on one foot, shoulders uneven.
    s. Leaning on both elbows.
    t. Leaning on the elbows, feet crossed, one foot in desk iron.
    u. Leaning on one elbow.
    v. Leaning on one elbow, feet braced back.
    w. Leaning on one elbow, legs crossed.
    x. Leaning on both elbows, feet crossed front.
  2. Chest collapsed.
    Minor positions noted as under 1.
  3. Sliding down.
    Treated as in 1.
  4. Shoulders uneven.
    Treated as in 1.

III. Twisted positions.
   1. Erect.
      Treated as in front positions.
   2. Shoulders uneven.
      As in front position.
   3. Pelvis front, shoulders twisted.
      As in front position.
   4. Sliding down.
      As in front position.

A study of the tabulations on Table I reveals certain facts. In the front, erect,—in the uneven shoulder positions,—and in the twisted positions—about the same variations in position of the feet appear. But in the sliding-down positions, whether front or twisted, the variations in faulty position of the feet are less in number. Many positions noted as to the legs and feet have disappeared, as if the pupil, in sliding down in his seat, were comfortable enough without needing a further brace of the feet or the arms. An interesting experiment was that made by one teacher, who asked her pupils to take the position each most preferred. Out of the class of fifty girls, twenty-nine at once took the position of sliding down in their seats with twisted shoulders. It was found that for all grades only one-third as many girls slide down in their seats as boys,—the ratio being 108 boys to 33 girls.

The habit of bracing one or both knees in the desk is more common among the boys than among the girls,—seven times as many boys taking the position as girls. Moreover, this position seems practically to end at about the sixth grade. Likewise the habit of sitting upon one foot seems to end for the boys as a whole in the same grade, but is continued with the girls in exceptional cases throughout the entire course. Thirty-four girls show this habit as opposed to fourteen boys. Moreover, the greatest number of girls having this fault is found in the primary and lower grammar grades. Yet pupils in high and normal schools have been found sitting upon one foot or standing to recite with one leg resting upon the chair. The habit of leaning upon the elbows seems to be lacking in the primary grades; but, beginning in the lowest grammar, increases in frequency in the higher grades. In noting the total for elbow positions, it is seen that nearly twice as many girls support themselves upon their elbows as boys. As the habit of bracing the

knees in the desk among boys and of sitting upon one foot among the girls grows less, the new position of bracing the feet in the desk irons increases, till, at the close, we find three times as many girls as boys having this habit. The latter, instead, extend their feet into the aisles. Among all pupils the tendency to brace the feet backward or forward increases as we go from the lower to the higher grades.

With the exception of a few sporadic cases, the twisted positions are more prevalent in the grammar than in the primary grades. In the twisted erect positions, the girls tend to cross the legs more than the boys, the latter bracing their feet in various ways. Beginning most notedly at the seventh grade is found the position "pelvis front, shoulders twisted." Yet there is a possibility that this position may appear in lower grades in such subjects as writing or drawing, later to become a habit in any recitation in higher grades. Another interesting point revealed by the study is the increase in complexity of positions from the lowest grade to the highest. In the lowest primary, a pupil may have the trunk twisted but the feet flat. In the highest grammar, we may find the twisted trunk combined with the crossing of the right leg over the left, the bracing of the right foot in the irons at the left, and the leaning upon the right elbow. It was due to this elaboration of detail that the committee at first seemed to have so many endless unclassified positions upon its hands.

Another point revealed by the study is the beginning of certain faulty positions in grade IV, and their continuation through the sixth or seventh grades, that is between the ages of eight and thirteen years. In the fourth grade, some positions appear for the first time, others noticed in the primary grades disappear before the seventh grade. Yet, as a whole, the number of faulty positions increases within this limit and then decreases. This may be due to the fact that, in grade four, the child finds himself, as regards work, in an environment quite different from that of the primary school. Yet the suggestive query comes, Is there any connection between this increase of faulty positions and the growing period of the child? And, finally, the detailed study of Table I verifies many of the cursory reports gathered in the spring.

The next step in the work was the simplifying of Table I, as is seen in the following:

TABLE II.

I. Correct positions.
II. Front positions.
  1. Erect.
    a. Variations in position of feet.
    b. " " knees.
    c. " " legs.
    d. " " elbows.
    e. " " shoulders.
  2. Collapsed chest.
    Variations as in erect positions.
  3. Sliding down.
    Variations as in erect positions.
III. Twisted positions.
  1. Erect.
    Variations as in front positions.
  2. Pelvis front, shoulders twisted.
    Variations as in front positions.
  3. Sliding down.
    Variations as in front positions.
IV. Uneven shoulders.
  1. Front positions.
    Variations.
  2. Twisted positions.
    Variations.

From Table II the third table was evolved.

TABLE III.

1. Correct positions. 13 per cent.
II. Erect positions.
  1. Variations of feet. 21 per cent.
  2. Variations in extremities. 19 per cent.
    a. Lower.
    b. Upper.
III. Non-erect positions.
  1. Sliding down. 13 per cent.
    a. Body front.
      (1) Variations in extremities.
        (a) Lower.
        (b) Upper.
    b. Body twisted.

(1) Variations in extremities.
(a) Lower.
(b) Upper.
2. Twisted positions. 23 per cent.
a. Erect.
(1) Variations of feet.
(2) Variations in extremities.
(a) Lower.
(b) Upper.
b. Pelvis front, shoulders twisted.
(1) Variations of feet.
(2) Variations in extremities.
(a) Lower.
(b) Upper.
IV. Uneven shoulder positions. 4 per cent.
1. Body front.
a. Variations of feet.
b. Variations of extremities.
(1) Lower.
(2) Upper.
2. Body twisted.
Variations as in "Body front."

The last table shows that 13 per cent of the 1,484 pupils were in correct position, but the detailed study of Table I showed that the number of pupils in good position increases from the lower grades to the highest. About 40 per cent. of the pupils were in non-erect positions,—13 per cent. were sliding down (9 per cent. when the body was front and 4 per cent. when the body was twisted),—23 per cent. of all the pupils were in twisted positions. In per cent., one-half of the pupils having the pelvis front and shoulders twisted were found beyond the seventh grade. Only 4 per cent. were noted as having uneven shoulders, but undoubtedly in many cases, this posture has been associated with others, as sitting upon one leg or leaning upon one elbow. The total of the per cents. equals 93 instead of 100, but that is due to the fact that a greater or less fraction was discarded in each of the six estimates.

Thus, the results of the tabulations from the primary and grammar grades have been summarized. In general, the high school reports show a continuation of positions found in the upper grammar grades, the complexity of the positions being

very apparent. In several reports dealing with high school girls alone, there appears a greater tendency than noticed elsewhere for the girls to slide down in their seats. But this may be accounted for by the fact that, in many of these observations, the girls were sitting upon settees rather than at the ordinary school desk.

While the preceding tabulations may be of slight value, yet certain thoughts are suggested, not only by observation of the reports themselves, but also by the helpful notes that the teachers have frequently made. Thus, one teacher says, "In a music or a reading lesson the position is good. In a study period few children keep a good position. In busy work, none." Again, the positions noted in one class during sewing were so faulty as to be amazing, when one considered the good positions of those girls in recitation periods. So the question arises, Are the pupils taking in their sewing, their sloyd, their cooking and their busy work, their more natural positions? If so, a study of the same pupils in consecutive periods of work would certainly prove interesting.

Again, from a teacher in one of the State Normal Training Schools comes the statement that the children recorded in poor positions are peculiar,—slow in body and mind. A comparison of the positions of the slow, the dull, or the defective children with those of the alert and strong would surely be of value.

Several teachers have reported that the faulty positions were invariably found among the children who were of an extremely nervous temperament, or who were physically weak. Every school-room has its exceptionally nervous children; and so in this direction may be another line of work.

Thus, as the subject broadens, it becomes evident why it was urged last June that the Section keep to one line of work for this year at least. Old questions are still unanswered. New ones have arisen. Suggestions for further work are many, but conclusions, as yet, cannot be offered, for the Section realizes that it has touched merely the confines of a subject that is closely connected, not only with the study of physical development, but also with the development of every child.

The Section is indebted to many public school teachers, through whose coöperation the reports have been largely gathered, and to Dr. R. W. Lovett, President of the Boston Physical Education Society, for many practical suggestions as to method of study.

THE AMERICAN GIRL OF TODAY.*

MODERN EDUCATION AND FUNCTIONAL HEALTH.

GEO. J. ENGELMANN, M.D.,

Boston, Mass.

The normal physiological status of woman, of healthy woman engaged in the active pursuits of life, is a subject, strange to say, of which we have hitherto known little or nothing, to which scientific investigation has never been directed: our knowledge has been of pathological conditions, of the sick, for they alone come under the observation of the physician, and the study of numbers sufficient to establish general laws seemed possible only in hospital or dispensary. In schools, where the opportunity is afforded of observing the healthy in numbers, certain phases of physiological import have been investigated, such as growth, height, weight, muscle force, eye-sight, hearing, but this one all-important function which is more intimately linked with mental, moral and physical well-being of the girl, has been a *noli me tangere* and in a measure rightly so, yet it is a course based upon false modesty, a modesty ill-timed and detrimental which opposes proper scientific investigation so essential as a foundation for the guidance of educational efforts, for the correction of errors already committed.

I shall here present the *conditions as they exist among the young women of this country engaged in study and in work,* in other words, the status of functional health as determined by modern methods of training, by occupations mental and physical.

These are fundamental facts, of physiological, of social, and of educational import, essential to the *Physician* as the first step toward preventive medicine, preventive gynecology whereby, fortunately, *the prevention of many of the disorders to which woman is subject* by virtue of her peculiar organization, *is possible*—possible with a knowledge of these facts, of the lesser functional

* Presidential Address, American Gynecological Society, Washington, 1900.

deviations, the conditions under which they arise and the causes which determine them; as a rule, these causes are all factors and conditions which interfere with a healthy performance of the female function during the great waves of female life.

Even more essential is a knowledge of these facts to the *Educator* who is in daily contact with the plastic impressionable form, who guides the developing girl throughout the most important period of her life; whilst apparently he is the instructor only, the mental guide, he greatly influences her physical welfare as well.

It is no less important to him who directs her mental training than it is to him who undertakes the physical development, and it is above all to physical trainers that we must look for the correction of existing evils, hence I urge upon them more especially, as I do upon the physician, the study of the developmental period, of the sensitive, responsive organism during the great waves of sexual life.

The Waves of Functional Life.—Dangers. Puberty, menstruation, labor, and the menopause are the undulations which characterize the functional life of woman, a period in this country of thirty-one and one-half years, from 14 to 45.5.*

These undulations are periods of highest physiological activity, periods of marked instability during which woman is most susceptible to influences mental and physical; these are the danger points, and it is during these that injury is wrought.

Many a young life is battered and forever crippled in the breakers of puberty; if it cross these unharmed and is not dashed to pieces on the rock of childbirth, it may still ground on the ever-recurring shallows of menstruation, and, lastly, upon the final bar of the menopause ere protection is found in

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* This is an approximate estimate, as my investigations in reference to the period of the menopause are not yet concluded and I have, so far, only 200 cases, 110 from my own practice and 90 from that of Dr. Chadwick; age of first menstruation, 14.2; of the menopause, 45, showing the period of functional life to be 30.8 years. Other American data I find none, but I believe that I am safe in asserting that, other conditions being equal, the period of functional life is longer in the precocious; as Mayer says, "early menopause is in direct relation to late menstruation." I find the age of puberty among school and college girls in the United States, whom I shall here mainly consider, to be 13.8 years; hence for general purposes I have taken an average of 14 years—with the menopause correspondingly somewhat later than shown by my data from dispensary practice, at 45.5—the child-bearing period being 31.5 years, about that observed in the middle European countries.

the unruffled waters of the harbor beyond the reach of sexual storms. It is for us now to chart the channel and plant the danger signals, that the ship may pass in safety.

During *the pubertal period* many receive the first blow; ere the girl is fully aware of the change which has taken place, or is warned by a mother of its coming and significance, she has needlessly exposed herself to injury, not serious perhaps, but often one which may sap her energies throughout life. *It is here that preventive gynecology must make its beginning*, and I shall in this paper present more fully the conditions which exist at *puberty* and those which accompany *menstruation*—the ever-recurring period of greater physiological activity and of susceptibility throughout the functional life of woman.

There is no question as to the sad and unnecessary sequences to *parturition;* we well know that large numbers owe their ill-health to organs injured in the process of childbirth. One of the leaders in our art has said that at least 50 per cent. of his patients are furnished him by the obstetrician (Coe[4]); though a positive percentage cannot be given, experience and case books testify to the frequency of labor as a cause of female suffering (Edgar[5]), and I may add that it is most frequently traceable to simple normal labor.

Mortality has been reduced to a minimum,* but morbidity is great. Even mortality is still greater than it need be in private practice; greater than it is in the huge lying-in hospitals. The consequent morbidity of simple normal labor is still far too high, and an ample field for preventive gynecology is presented in obstetrical practice, in the management of physiological pregnancy, labor, and childbed. This means surgical asepsis, a more careful study and closer attention to the management of healthy normal labor, which soon confronts the young physician in his practice and upon which he looks too lightly.

The *climacteric,* too, the last of the functional waves, is a danger period, known to the laity even as it is to the profession—a period of highest susceptibility, dangerous to the nervous organism rather than to the physical structures, with a liability to disturbances, in the main avoidable by precautionary measures, and which should be guarded against by proper management in the preceding years, especially by the correction of all irregularities of the reproductive function.

* For the last ten years, in the Clinique Baudelocque, the highest mortality was 0.42 per cent, and the lowest 0.15 per cent.

These are important epochs in the iife of woman; but it is to the *great waves of earlier life* during the impressionable period of development that I would now direct your attention —to puberty and the formative period, during which this all-pervading function which controls woman's entire being is itself so readily moulded and controlled by surrounding conditions of all kinds.

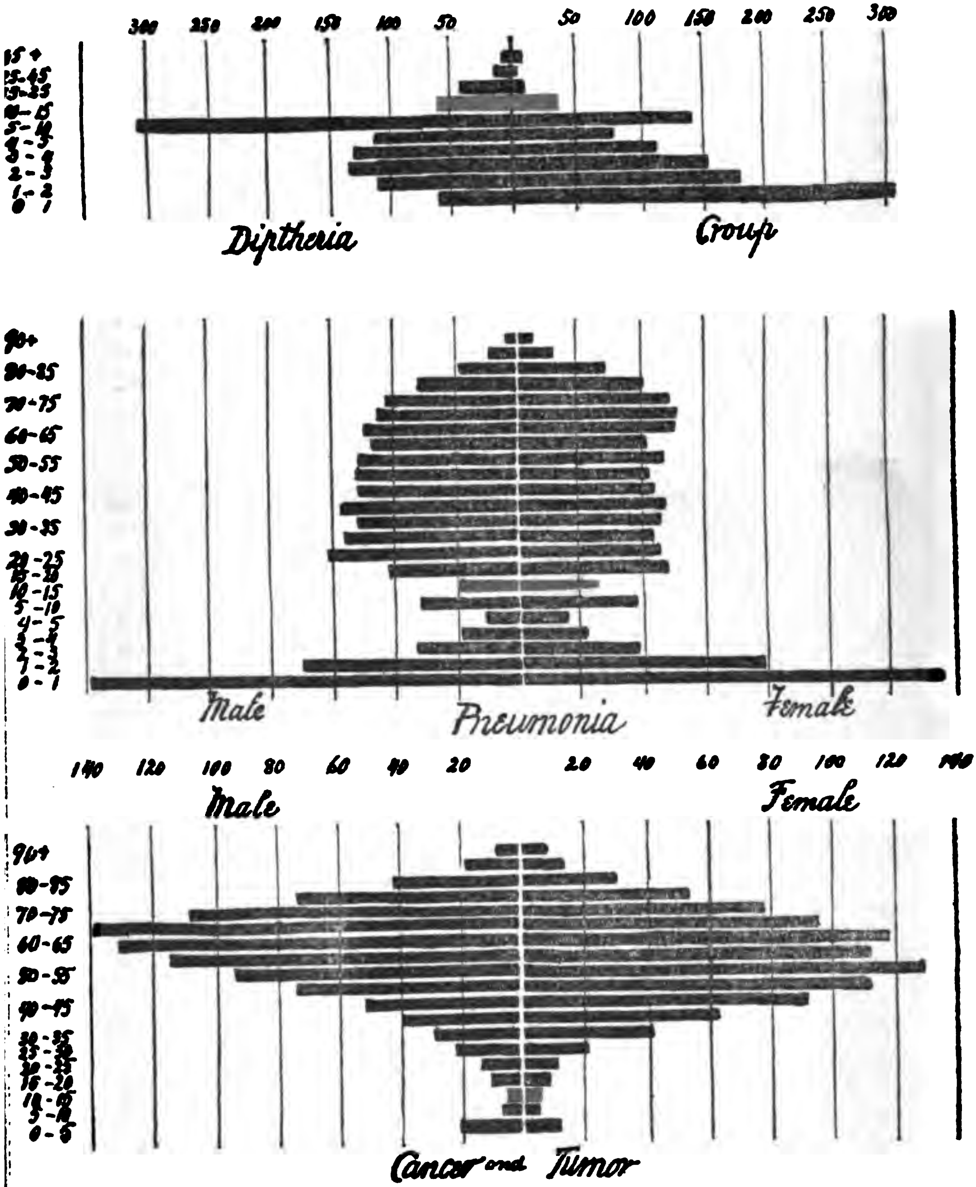
Puberty itself, the establishment of functional life, is swayed by the most varied factors; race, climate, and many other conditions we know influence its advent, but equally, if not more, is it controlled by social surroundings and mental status.

I shall here note only the influence of mental development, as being, as far as my investigations in the United States show, the prominent factor and directly expressive of the relation of mental to functional activity, which is emphasized at a later period by the effect of mental application on the menstrual function as marked as the converse, the influence of the function on mentality.

The investigations of Mayer, De Boismont,[6] Joulin,[7] of Weber,[8] of Radzewitch,[9] and others have shown that the wealthy, the citv-born, are more precocious than their poorer or their country-bred sisters; but my own investigations more especially indicate the influence of *mental stimulus.* Thus in my St. Louis dispensary practice I found the average age of first menstruation of American-born (2,315 cases), like that recorded by Dr. Emmet,[10] to be 14.24 years; much the same as that found by Dr. Chadwick in Boston (2,503 cases), at 14.3; 697 of my own private cases, mainly from a consulting practice throughout the Southwestern States, smaller cities and country towns, representing the better classes, show 14.3 years as the time of development. The highest class among the working girls of Boston (800 cases) attains puberty at 14 years. Then we come to the high and normal school girl at 13.8 (1,342 cases), and in 2,060 college girls at 13.5. Neither birthplace nor parentage influences the development of the girl and the appearance of puberty as do the surroundings and mental stimulus of childhood and early youth, which give a variation of nearly one year, as noted in the 6,549 cases under my own observation. I desire to impress the susceptibility of the function to mental influences, and likewise the controlling influence of the function upon the anatomical, physiological, and pathological status of the growing girl.

Susceptibility to infectious and fatal disease in the pre-

CHART I.



Mortality by Age and Sex. **I.**
Lowest in Prepubertal Period
from Eleventh Census of the United States

CHART II.

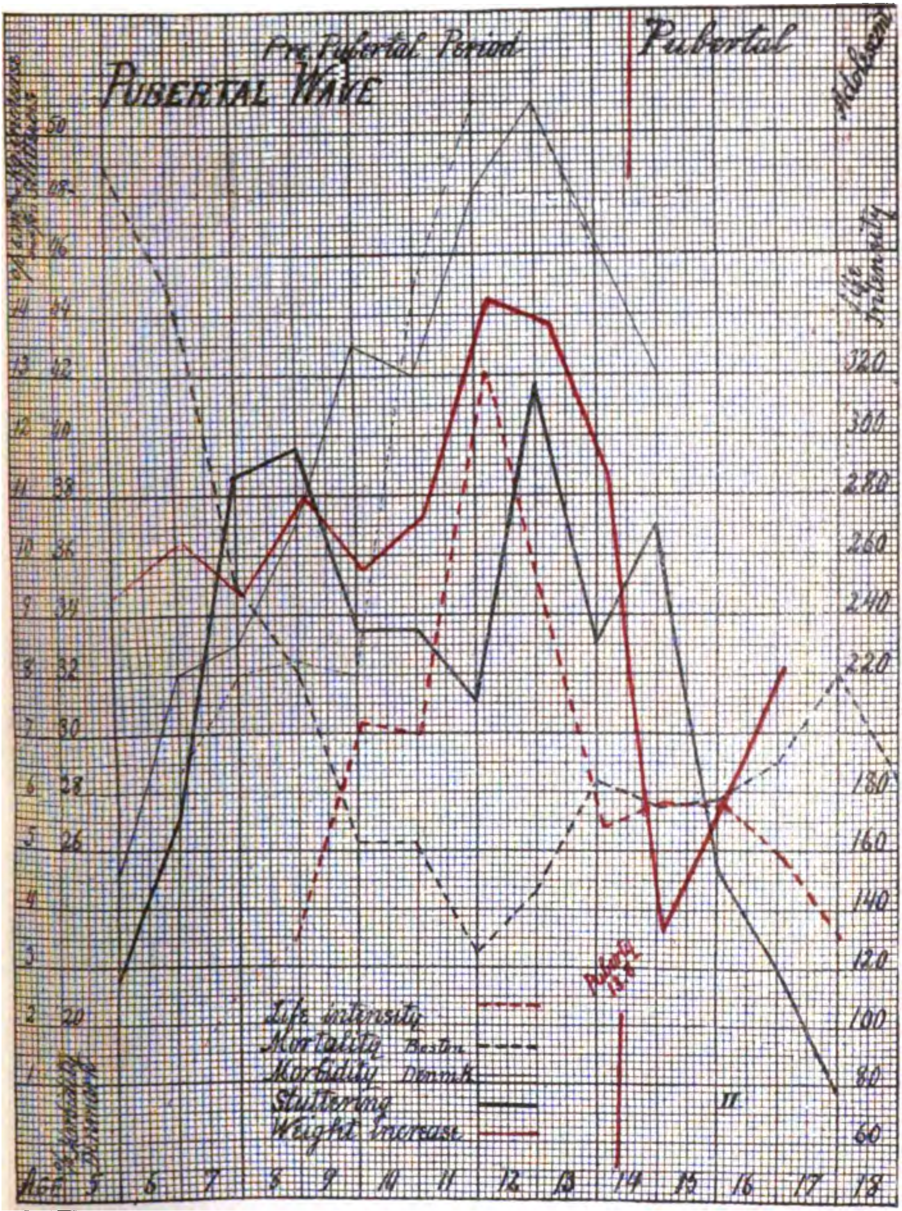

Pre-Pubertal Period
Pubertal
Adolescence
PUBERTAL WAVE
Life Intensity
Life intensity
Mortality Boston
Morbidity Denmk
Stuttering
Weight Increase
AGE 5 6 7 8 9 10 11 12 13 14 15 16 17 18
320
300
280
260
240
220
180
160
140
120
100
80
60

CHART III.

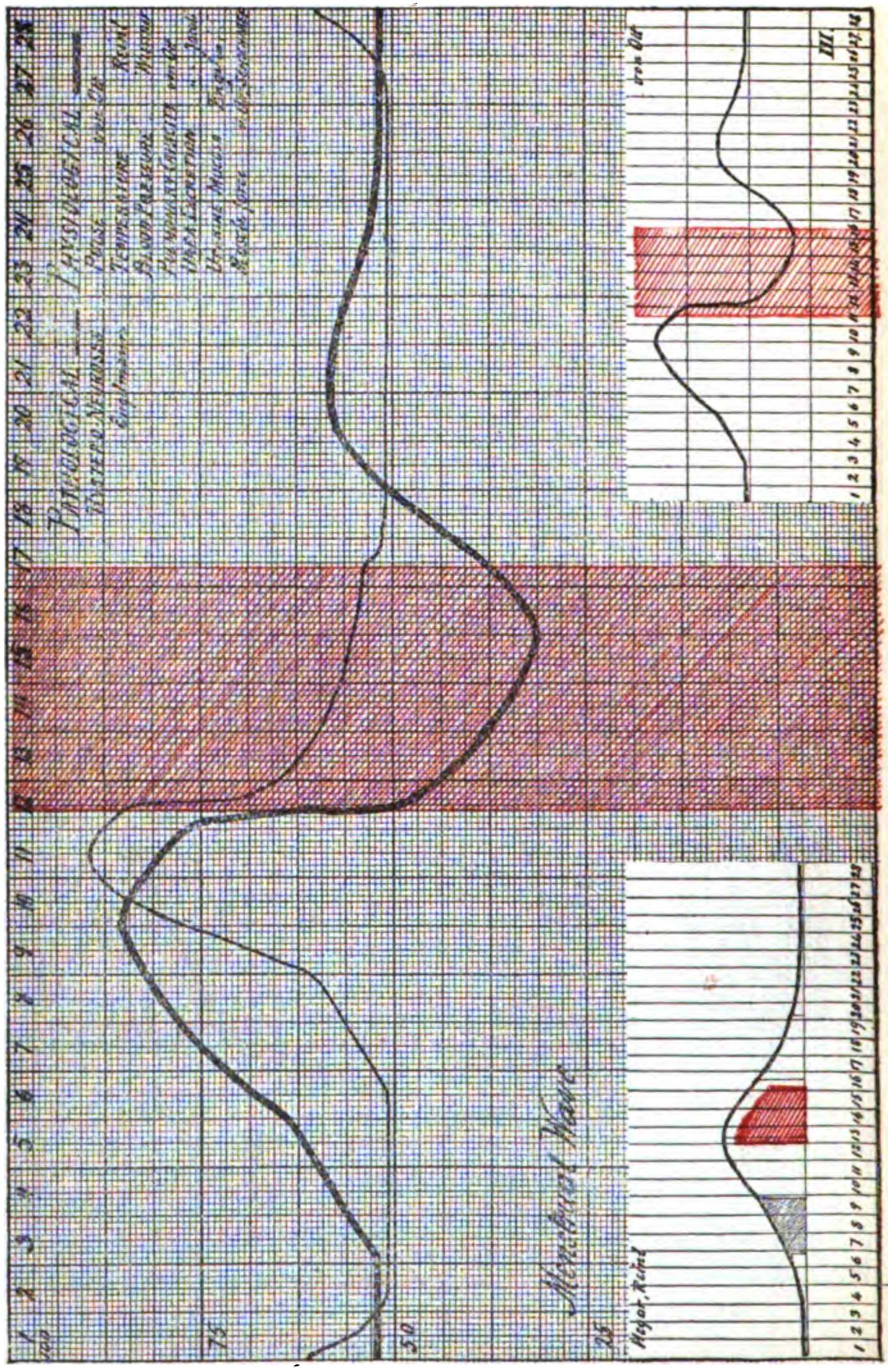


CHART IV.

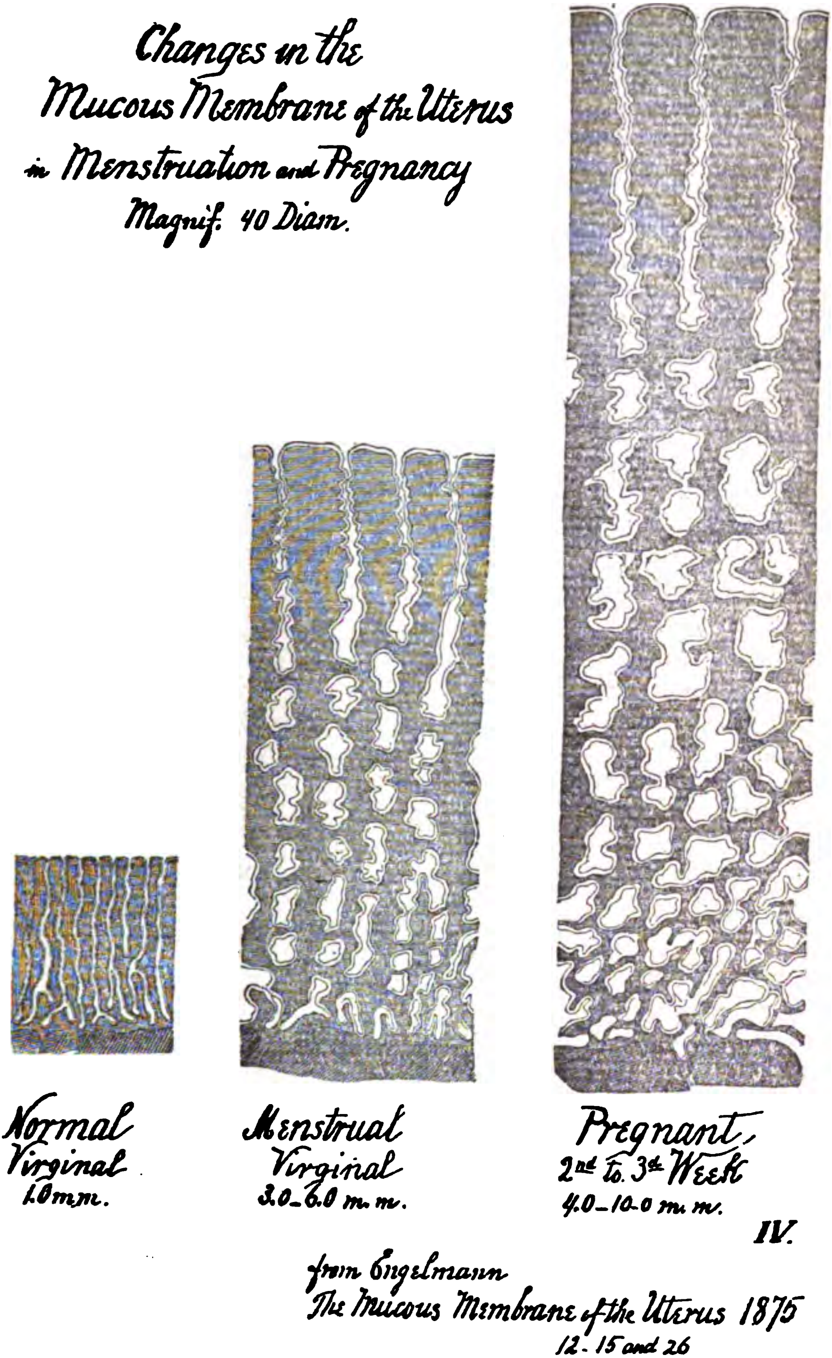

Changes in the
Mucous Membrane of the Uterus
in Menstruation and Pregnancy
Magnif. 40 Diam.
Normal
Virginal
1.0 mm.
Menstrual
Virginal
3.0–6.0 m. m.
Pregnant,
2nd to. 3d Week
4.0–10.0 m. m.
IV.
from Engelmann
The Mucous Membrane of the Uterus 1875
12–15 and 26

CHART V.

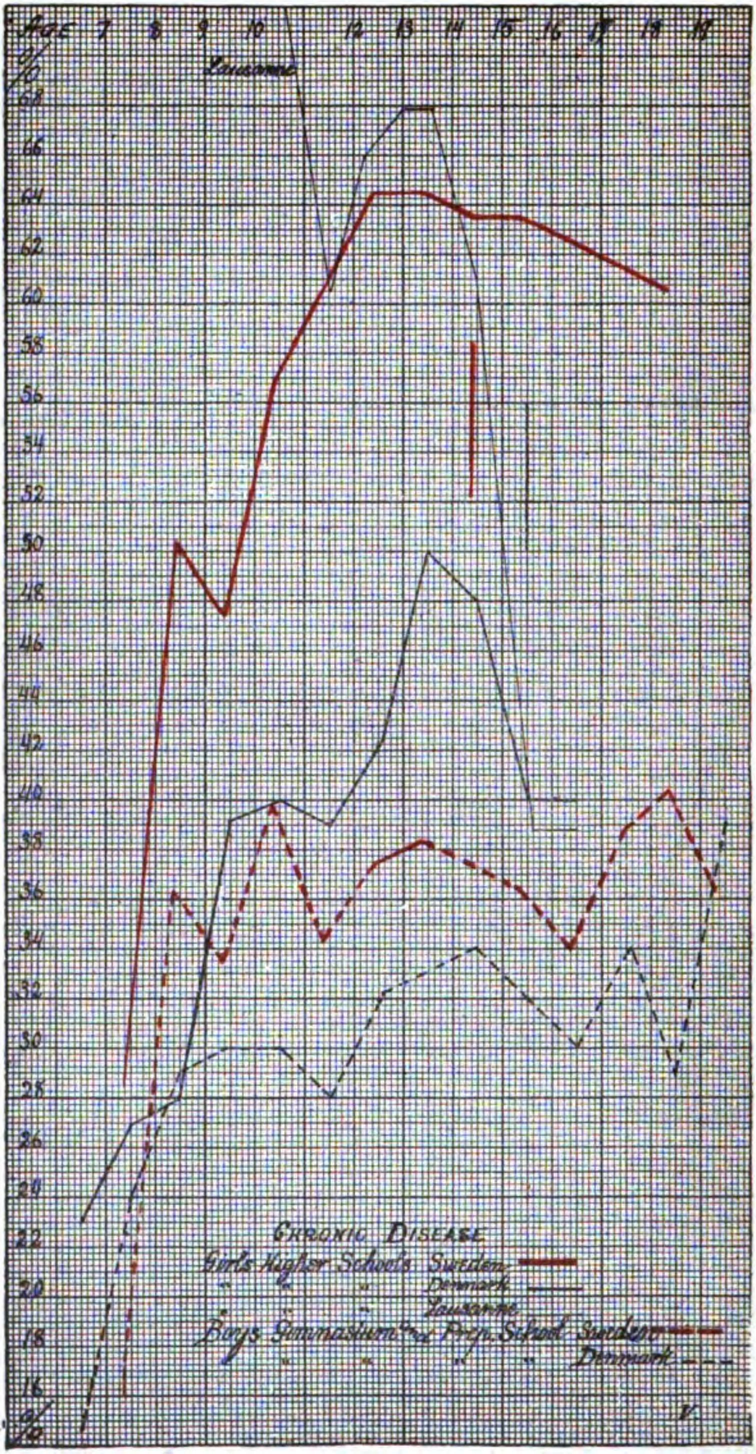
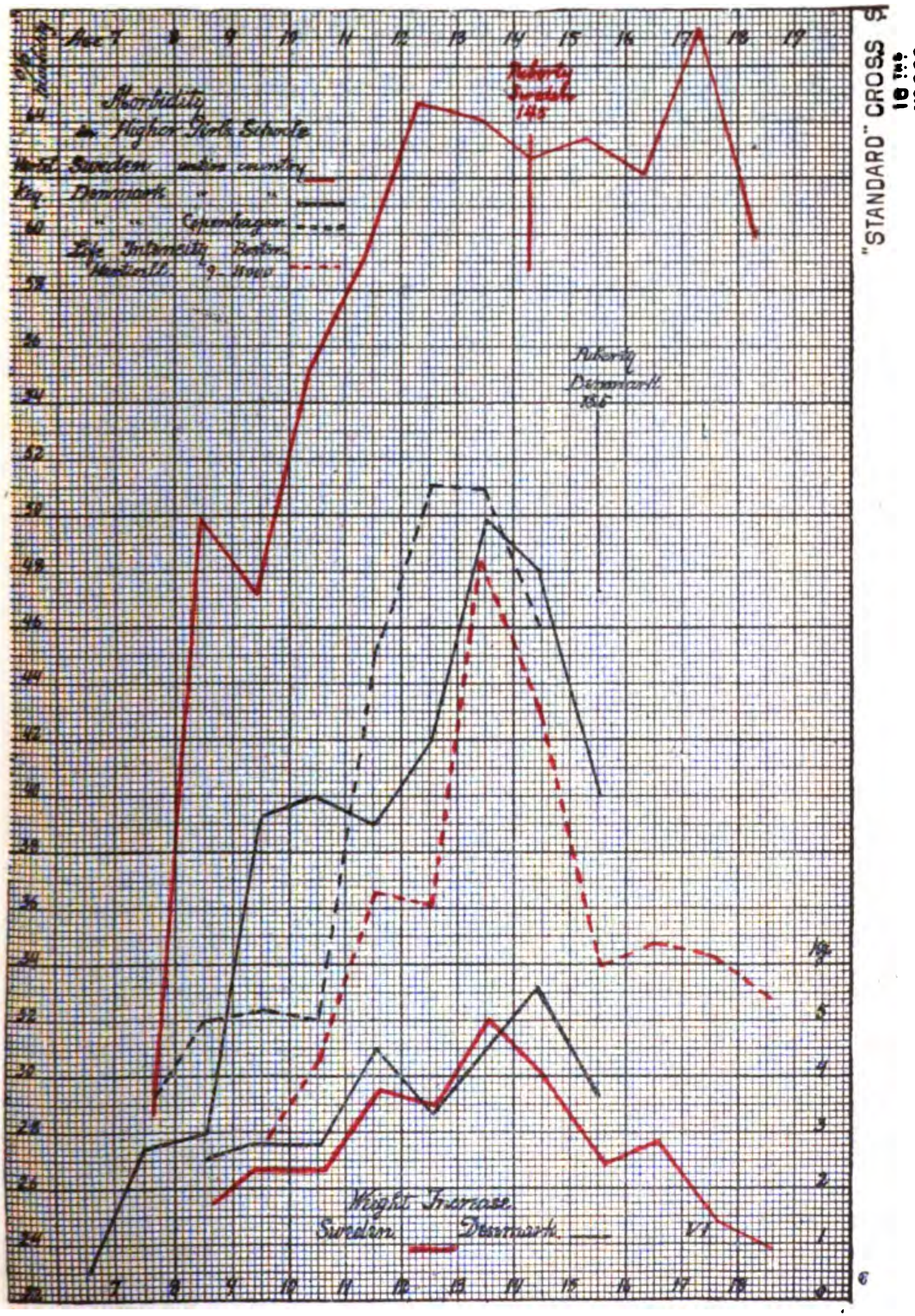
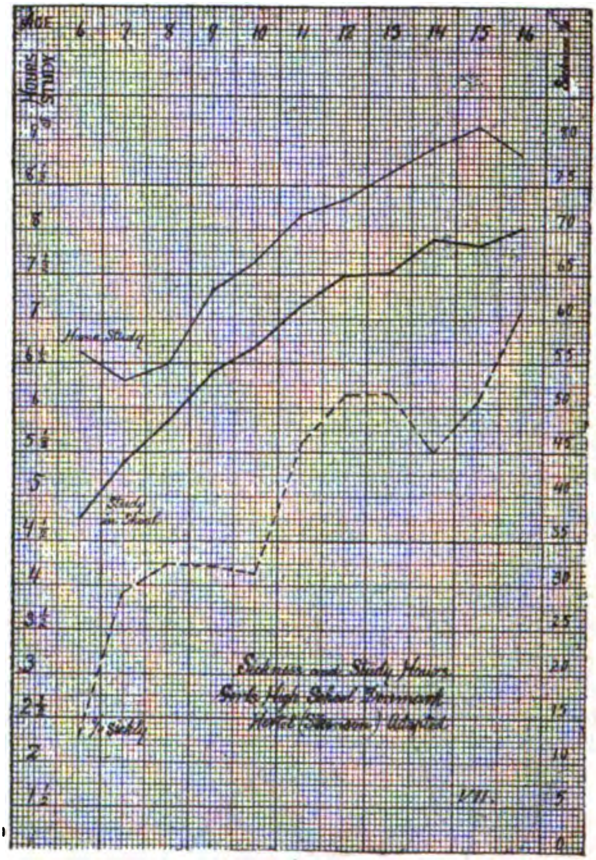

Age
7
8
9
10
12
13
14
15
16
Lausanne
%
68
66
64
62
60
58
56
54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
Chronic Disease
Girls Higher Schools Sweden
" " " Denmark
" " " Lausanne
Boys Gymnasium & Prep. School Sweden
" " " " " Denmark
V.

CHART VI.


Morbidity
in Higher Girls Schools
Sweden entire country
Denmark
Copenhagen
Life Intensity Boston
Weight Increase
Sweden
Denmark
"STANDARD" CROSS

pubertal period is reduced to a minimum; mortality is at its lowest, as shown by the United States census (Chart I.); but this, unfortunately, gives quinquennial periods, and affords only a general indication of conditions, as the years from 10 to 15 include with the prepubertal period more than one year before and

CHART VII.



after, both eras of higher mortality; but notwithstanding this the diminution is very apparent, particularly striking in the death rate from pneumonia, which begins to increase from the fifth to the tenth year, then drops from the tenth to the fifteenth, to rise at once to double this in the next five years. Chart II, representing the conditions during the pubertal period, is instructive, as the

facts there shown have reference to one and the same class and condition of children, school girls of Boston, perfectly well comparable, although not all from the same census years.

Physiological Fluctuations.—To show the correlation of conditions physiological and pathological, mental and physical, with functional development, I have charted mortality from the data of Hartwell, covering the census years 1875, 1885, and 1890; life intensity, the ratio of the number living to the number dying, expressive of vitality, from Hartwell[12] (census 1875, 1885, and 1890), and also the ratio of stutterers, expressive of nervous irritability (1893 and 1894); growth is represented by the annual percental increase in weight (Bowditch,[11] 1875), and the susceptibility to minor derangements, nervous and physical, by morbidity, for which I have been obliged to refer to transatlantic observations.

Morbidity has, unfortunately, never been investigated in our American schools, hence I have accepted and here introduce the data of Axel Key[13] (after Hertel, Table XXVI) from the Danish schools; adapting the curve to the conditions of the American school girl by giving it the same relation to the period of pubertal development in this country as it bears in the original to the time of first menstruation in Denmark, later by one and one-half years than in this country. Life intensity, strange to say, corresponds with morbidity, and both directly opposite to the lines of mortality. Where mortality is lowest morbidity and life intensity are highest, during the period of greatest physiological activity preceding the advent of the function.

All these conditions are clearly correlated and closely associated with, if not dependent upon, the development of the reproductive function, the activity of each at its highest in the prepubertal period, the apex reached some two years before the appearance of menstruation, and the lowest point with the advent of the flow. This is true of life intensity, "which power to resist lethal influences is an expression of the nutritive activity of the organism during its period of greatest and most rapid growth" (Hartwell). Growth, here represented by percental increase in weight, also morbidity, follows almost the same lines even to the lesser rise between the eighth and ninth years; so does hysteria (Cloblatt[14]) and stuttering, an evidence of increased nerve excitability and susceptibility of the nervous system to motor disorders; all life intensity, strange to say, corresponding with morbidity as it does with stuttering, varies in

a directly contrary sense to mortality, which is at its lowest ebb in the prepubertal period and increases with the advent of puberty; the same influence seems to control all, and the direct dependence of each and every one of these conditions upon functional development is demonstrated by the variation of its curve in direct relation to the variation in the time of first menstruation. In Denmark puberty is later by one year than in Sweden, and the period of greatest increase in weight is later by one year than it is in Sweden (Chart VI). So is the period of highest morbidity later in Denmark than it is in Sweden. The period of highest morbidity in the higher girls' schools of the interior of Denmark (Hertel[15]) is later by one year than it is in Copenhagen (Chart VI) because puberty is later by one year.

Puberty is by one year or a little over later in boys than it is in girls, and the age of greatest increase in weight is by one year later in Danish boys than it is in Danish girls; by one year later in boys in Sweden (Key), in Boston (Bowditch), and in St. Louis (Porter[16]) than it is in girls. Morbidity is likewise later by one year in boys than it is in girls in the same classes of schools both in Sweden and in Denmark; moreover, the changes are far greater in girls than in boys, the curves more marked, the apex higher in girls than in boys, as a rule, the pubertal changes are greater, more acute, the influence of functional development is more marked.

With the great wave of the pubertal period, covering years, we may well compare the menstrual wave (Chart III), which barely covers as many days, but shows precisely similar conditions. Anatomical, physiological, and pathological facts clearly indicate these to be undulations similar in kind, varying only in degree, as I have always maintained since this truth was so deeply impressed upon me during the course of my investigation of the uterine mucosa. Each menstrual period presents precisely the same characteristics—heightened activity before, a depression during the continuance of the flow, with a return to the normal soon after cessation, as first shown by Mary Putnam Jacobi[17] and by Goodman.[18] The curve pictured by Von Ott,[19] of St. Petersburg, is so thoroughly in accord with my own observations with reference to the physical and psychical changes during the monthly period that I have reproduced it as characterizing the menstrual wave in all its phases. He thus records pulse, temperature, blood pressure, muscular force, and pulmonary capacity, and it is almost equally correct for morbid nervous symp-

toms as characterized by the hystero-neuroses, which I tabulated over twenty years ago. It is true, anatomically, as I have shown in the changes of the uterine mucosa (Chart IV), and it is corroborated physiologically by more recent investigations of Schichareff,[20] Wiessner,[21] and others upon pulse, temperature, and blood pressure. The activity of every function is intensified before the appearance of the flow, with the exception of nerve excitability, as shown by the tendon reflex (Von Ott), which reaches its height during the flow, as does radiating heat by reason of the diminished blood pressure. This I have demonstrated by a study of surface temperature in the axilla and on the abdomen, and Von Ott by the thermofeigoscope of Arnchem. The depression noted in the investigations, and so evident to the casual observer even, is well marked. Though apparent in every phase of physiological activity, it is not recognized in the curve of Hegar, Reinl,[35] which I append for comparison (Chart III).

During pregnancy and labor we have similar conditions; but this wave is one of longer duration and much greater intensity as to anatomical changes, blood pressure, pulse, temperature, and variations in blood corpuscles. The nervous symptoms, the perverted tastes, the nausea and vomiting of pregnancy are like the gastro-hystero-neuroses of the premenstrual period (Engelmann[22]), as the hot flushes and the nervous excitability of the menopause correspond to those of the premenstrual and prepubertal periods.

Hematopoiesis is increased during the flow (Hayem,[23] Duperie), so also the number of white corpuscles from one to two thousand in the millimetre (Reinert[24]), with a relation of 1:247 during the flow and 1:405 in the intermenstrual period. The number of red corpuscles is greatest just before the appearance of the flow, diminishing with its coming and again rising on the day after cessation (Reinert). As the constituents of the blood are affected by the menstrual wave, so is the circulation. Scientific investigation has shown the increase of blood pressure preceding the flow. Practically we recognize it by the increased swelling at a point of fracture, by the enlargement of the thyroid; moreover, there is a certain change in the character of the circulation, indicated but not as yet clearly defined, noted first by Jorisenne,[25] 1882, as occurring with such regularity during the early months of pregnancy as to constitute a reliable sign, and in 1885 observed by Louge[26] during menstruation, and that is the constancy of the pulse rate in different body positions. In

man and in the non-pregnant, non-menstruating woman the pulse varies with a change of body position, being more rapid by ten to fifteen beats per minute in the perpendicular than it is in the horizontal position. During pregnancy and menstruation it has been claimed that such variation of pulse in lying and standing does not take place, but that the pulse remains constant as in cardiac hypertrophy (Graves).

While later research has failed to confirm this fact, the investigations of Fry,[27] 1882, and Stadler,[28] 1886, in the pregnant woman, demonstrate a condition of the circulatory system or its controlling nerves differing from the normal and identical with that found in my study of the variations of the pulse during menstruation—namely, that this variation in the normal from ten to fifteen beats is usually less, sometimes very slight, during the period of functional activity, but not often entirely absent, with constancy of pulse throughout all changes of position from horizontal to perpendicular. This, like other changes in the circulation, the slowing of the pulse, the diminution of pressure, can be accounted for only by a reflex nerve influence, by a predominating physiological wave, and not by the loss of blood in the menstrual flow, as even a copious venesection in eclampsia causes no decrease in pressure, and the menstrual wave has been observed recurring at the proper period, clearly marked, notwithstanding the removal of both ovaries and the absence of any flow of blood (Reinl.)

The sensory organs likewise reflect the functional condition, the field of vision is contracted (Finkelstein,[29] Meyers,[30]), and, by intensification of the functional wave in pathological conditions of the sexual organs, sight, hearing, and smell are interfered with. These facts, especially the marked physiological fluctuations of the pubertal and the menstrual period (Charts II and III), will suffice to demonstrate

1. The identity of these waves of woman's functional life, the identity of causes and results.

2. The disturbed equilibrium of the entire system during periods of functional activity.

Functional Health.—The subject is a difficult one for scientific investigation, but records of able observers have accumulated until there remains no doubt as to the influence of the function upon the entire economy; every organ and every system is more or less involved, and that physiological changes so varied in kind are not without marked influence upon the sen-

sitive organism of youth is evident. How and to what extent it is influenced I shall here endeavor to show. I shall present the facts as found, the conditions now existing among the young women of our country during the period of development in the various phases of life, to determine the health of the American girl of today, as shown by its most potent and sensitive index—her functional activity—and how far this is influenced by the restless physical activity and mental stimulus of the age.

To obtain satisfactory results we must record, not individual observations or professional experience, which deals with pathological conditions alone, but we must obtain the facts as found among the representatives of American girlhood and young womanhood under the varying conditions of modern-day life, and this could be done only in institutions of learning and in large business organizations.

It seemed to me important that the girl in study and in work should be represented, from the advent of puberty through the period of adolescence until maturity, when a more stable, less impressionable condition is attained: from the fifteenth to the twenty-sixth year. This means high and normal school, college, and business house, as representing respectively mental and physical labor, and, between the two, the normal school for physical training approximating mental labor, and the training school for nurses nearing physical labor, the average age being in the high school, 16; in normal school and college, 19 to 20; in physical training, 22.6; the nurse, 26, and the working girl from 15 to 30.

The importance of the subject and the practical bearing of the results obtained are perhaps more fully apparent when we realize not only how important but how large an element of our population is in question—374,487 young women in colleges and high schools, and over 1,000,000 of the same ages in the industries. According to the United States census of 1890, there are 32,751 young women in the colleges of this country, colleges for women, co-educational institutions, and colleges for men; there are 341,736 girls in the secondary educational institutions, 260,413 of these in the public high schools, and it is to these that attention must pre-eminently be directed, the largest number and the most dangerous period.

In the employments 3,914,571 women of all ages are noted in the census of 1890, and I estimate fully 1,000,000 of these to be under 20 years of age. None are recorded under 15, while the census of 1870 shows over 10 per cent.—191,100—between

10 and 15 at work, the total number of women employed in the industries at that time being less than one-half of what it was twenty years later in 1890. Many under 15 are undoubtedly now employed, and ages incorrectly stated; however, fully 1,-000,000 must be under 20, in the formative period, and these demand consideration in this inquiry.

The difficulty of such an investigation seemed great, and the field was a new one. My inquiries were ignored by some; others sent vaguely encouraging replies or expressions of interest and appreciation of the importance of the work, with regrets at the total absence of any such data of the girls under their care. Some few progressive institutions responded most interestedly and aided by active co-operation.

While I had met with many failures, these failures in themselves have been most instructive.

I persisted, and my faith in the progressive spirit, the broad gauge, and the intelligence of the American woman, the American educator, has not been disappointed.

Officers of great institutions have made the inquiry, which was met in an intelligent spirit by the young women under their charge, and, where that for the moment was not possible, have directed a careful watch over the functional health of the girl for the future. It was gratifying to find that in schools and colleges, here and there throughout the country, these data had been secured for some years and the inquiry had been steadily pursued by enthusiastic workers of whom we hear but little, yet who have of recent years become a most important factor in the educational problem, and have already done much for the development, for the functional, physical, and mental health of the American girl —these are the instructors in physical training.

Among them I have found interested, devoted workers, who are doing what the mother, the family physician, the educator, has failed to do—caring for the functional health of the girl. To them I owe the wealth of information, the data accumulated during years of laborious work or secured at my instigation. To them I owe the results I now present to you—important physiological data which hitherto have been overlooked or ignored.

Existing conditions.—Nearly 5,000 of my records are available for a consideration of now existing conditions—all, with the exception of the nurse and a small proportion of working girls, from young women during the period of adolescence, with

a history of previous conditions to early menstrual life and functional development.*

So much of interest appears that I can, in the brief space allowed, no more than indicate the more striking and significant of the many results which have developed in the study of the accumulated data.

Regularity and *frequency* of recurrence of the function are markedly controlled by psychical conditions and nerve influences. This is equally true of the accompanying pain, both direct and reflex. Less distinct is this influence upon duration and quantity, clearly existing, but with less regularity of result, responding freely in individual cases and to more pronounced mental changes.

The variations in frequency are along clearly marked lines, and, like other changes, most marked in the impressionable system of the young, as clearly shown in the records from educational institutions. The effect of mental strain and application is evident in increased frequency, while change of conditions and surroundings retards; both influences appear in schools. According to the existing conditions, sometimes one is prominent, sometimes the other; sometimes they combine to produce results which are indistinct in their variations.

In the college the freshman year shows greater irregularity with marked infrequency. The experience to the girl is a new one—a complete change in her life and surroundings which influences the menstrual function as does the change in the emigrant, often leading to prolonged amenorrhea; this emotional phase overshadows the contrary effect of mental application, which, moreover, in the first year is slight, as studies are not pursued with too great vigor; later, with increase of mental work, the frequency of menstruation, to which it leads, begins to appear. In college and boarding school with change of surroundings we find a retarded flow and even amenorrhea. In the normal school, on the contrary, the condition is a very different one; no striking change of any kind has taken place; the girl, amid the same surroundings, as a rule, continues her home life, and the change from the high school is but that from one institu-

* To be precise, 4,873; 4,161 individual records, and 712 of the same pupils taken a second time under different conditions, at the beginning of the junior and the end of the senior year, and additional value is given this by the fact that in the same institution both were always taken by the same observer.

tion to another of very much the same kind. Her studies are serious, she is preparing for her life's work, and mentality is deeply involved.

Effects of these various conditions quickly appear, showing in the first months if the system is susceptible or the change great, and menses delayed in school or college resume the normal habit during vacation by relaxation and resumption of the accustomed home life. Even the short Christmas vacation often suffices to bring about a decided change.

Very strikingly are the conditions changed and menstruation retarded for the student midwife in foreign countries; coming from rural surroundings, with a mind untrained to study, all is new, and amenorrhea within one or two months the rule. This was found in 57 per cent. of the 114 cases upon which Schrader based his investigation. So also in college this emotional retarding of the period develops speedily. Dr. M. A. Wood, who carefully observed the girls under her charge as instructor in physical training, writes me that it is surprising how quickly college life influences the menstrual function; that the effect in many already appears in the fall term (September to December) of the freshman year, though in others it develops later. More speedily even is the reaction to close application to study, and the cramming for examination with its concomitant excitement, which may result at once in a premature appearance of the flow, or is quickly followed by greater frequency and irregularity of appearance. This is in part due to physical tire, which has this effect, as fatigue, frequently debility from illness, shorten the interval and increase pain and amount of flow. The mid-year examinations in the later years, when these tests assume importance, are followed by more or less functional derangement, and I am told by observing instructors that they are to be looked upon as more deleterious, perhaps, to functional health than any other one cause in college life. We observe in this respect the same variability which I have again and again noted in the menstrual function, and at times mental strain retards; but whether hastened or retarded, these changes are all accompanied by increased irregularity and pain. In school and college we find irregularity in over 50 per cent.; but, regular or irregular, by far the greater number are retarded, that is, with an interval of more than twenty-eight days, and especially is this true of the freshman year: records taken at the beginning of this year, upon entering school or college, are of little value in determining the

effect of the change as yet, but when taken at the end of the term become indicative, as we then see by Table I, the results more marked.

TABLE I.

Frequency of Recurrence.	During College.	Before College.
Under 28 days	15 per cent.	30 per cent.
28 "	32 "	30.5 "
Over 28 "	53 "	39.5 "

Table I shows the change as recorded in one college, together with the percentage of frequency which may be assumed as a fair average. The intervals are greater, the recurrence of the period less frequent after the beginning of college life. In the normal school, as we have seen, we are more likely to observe a shortening of the interval. Expression of this we find in Table II from a normal school where close application is exacted.

TABLE II.

	During Normal School life.	Before Normal School life.
Class with 1 1-2 hours gym	26.56	27.03
Class with 3 or more hours gym	28.43	29.

This table is moreover instructive as showing the influence of physical training. The two divisions of this school of over 300 with the same studies differ as to the time given to exercise. Division I has only two periods, or one and one-half hours a week, for physical training, and the result, together with hard study, is an average frequency of 26.56 days in place of the normal 28 days, or of the 27 days of these girls before entering the normal school. In the other class we see a similar effect modified by the compensatory action of physical training to which from four to six periods weekly are given. The longer original interval—29 days in this case—of girls more given to out-door exercises is reduced only to 28.43 by reason of their greater physical activity.

In some freshman classes the average is as high as 36.75. I have found none, even in a senior class, below 26.56, which is indicative of hard study. The general average in schools is nearer 29 days. Physical exercise regulates both frequency and duration, bringing about a healthy change with approximation to the normal, moderating frequency and amount if too great, and increasing it if menstruation is delayed.

Duration, as a rule, is lessened to some extent in the course of school life, the general average being 4.6 days, varying for different conditions from 4.4 to 5.5, with slight decrease from two-tenths to four-tenths of a day in time of duration, which

may possibly be but one of the changes to be expected, as Emmet in his study of the subject (page 161) finds 4.66 days to be the average, beginning with 4.82 at puberty (2,080 cases); merely in those who are regular from the first, and these are not many, does no change take place. In most cases duration is shorter after some years than it was when menstruation was first established.

As in other records, my own data show less variety and difference of result than is evident in European observations; but comparisons are almost impossible, as records hitherto published are from laboring classes, or at least from women later in life and with functional disturbances. 3.6 days is the average for Norway, as cited by Vogt,[31] with an interval of never over 28 days, always 28 or less. Faye[32] gives 4.26 days, and Mayer, for Berlin, 20 per cent. as the largest number at 7 days.

Regularity is difficult to determine, as standards differ; but whether we accord it more or less liberal limits, it is not the rule, and irregularity is frequent, increasing from 5 per cent. to 10 per cent. in most of the higher institutions and in lines fairly parallel with pain and discomfort. In isolated cases only under the best hygienic conditions do we see the converse.

TABLE III.

Group.	Number.	Class.	Percentage of sufferers.	
			During school or college.	Before entering.
College	100		95 per ct.	90 per ct.
In business	800		83.3 "	71.5 "
College	50	Freshman	74 "	69 "
		Higher classes	80 "	60 "
Nurses	169		73 "	69.1 "
State Normal School	105		81 "	70.5 "
" " "	100		77 "	76 "
Norm. Sch. of Gym	98		71.4 "	66 "
Normal School, City	306	Less hrs. gym.	67.1 "	57.4 "
		More hrs. gym.	64.7 "	58.2 "
College	1000	Freshman	66 "	
	125		60— "	60+ "
	223		57.84 "	
	45		57 "	67 "
	103		56 "	
Normal School, City	539	Junior	54.10 "	
		Senior	53.02 "	
High School	100	Junior	42 "	
		Senior	32 "	

Other Records.

Author.	Locality.	No. of cases.	Class.	Per cent.	Notes.
Kennedy	Worcester	125	High.	78.4	
De Boismont	Paris	370		77	
Col. Alumnæ Assoc.	U. S.	705		66	53 per cent before; organic troubles increase from 24 per cent to 36 per cent.
Jacobi.............	Scattered	268		65	35 per cent; no pain.
Tuckermann........	Cleveland	186	High.	46	Alumnæ.
				62	Left school.
				57	Still in school.

Other Records.

Suffering during the menstrual period is more frequent than generally admitted, so much so that, like irregularities of the climacteric, it is erroneously looked upon as a necessary and unavoidable evil.

Table III shows a percentage of suffering under different mental and physical conditions. The numbers are high, owing to the fact that I have included moderate pain in this group, suffering of every degree and kind save the more trifling discomforts, suffering being classified as *severe—some, none,* severe and some here combined, and the result verified by a second question as to kind of suffering, languor, headache, or pain; some languor, and headache alone, usually about 15 per cent., is not here considered as suffering.

In this very brief and general consideration I cannot enter into details, but it may be well to note the fact that severe suffering exists in from 11 per cent. to 18 per cent.—*i.e.*, one-fifth to one-fourth of those experiencing discomfort during the period suffer severely. The very high percentage of suffering (95 per cent.) in one of the higher institutions of learning is rather surprising, and can only be explained by the fact that all discomfort has here been considered; but the figures are correct, as this investigation was made with the utmost care by one of the medical officers of the institution.

As is to be expected, greater suffering is likewise found in the business woman, averaging in the class here considered 83 per cent., but this varies even in the same class of business, the department store, with the character of the work. The girl behind the counter, who is on her feet most of the day, with but

little space for change of position, here classified as standing, shows 91 per cent.; still those who sit—bookkeepers and stenographers—show 82 per cent.; and those who have a certain freedom of motion—floor-walkers, cash girls, packers—are noted with only 78 per cent.

The pupils of the nurses' training schools 73 per cent., perhaps not quite just, as the numbers are as yet small and the records by far less perfect than those of any other class; but the results, such as they are, demand investigation, since we know that only women in perfect health are admitted.

That pupils in the normal school for physical training should appear with 71 per cent. would seem inexplicable, as these are young women under the best possible conditions, with an apparently most favorable combination of mental and physical work. A better state of functional health is to be expected, and we should certainly find very different conditions were it not for the fact that girls already broken down frequently undertake this course for the purpose of restoring health wrecked in previous occupations; more frequently it is the teacher or the normal school girl. As a consequence they enter under most unfavorable conditions.

In school and college we find too large a proportion of sufferers—from 40 to 70 per cent.—and I must call attention to a normal school in which one-half of the pupils devote but two forty-five-minute periods weekly to gymnastic exercises, while others allow four and more. Among those devoting more time to physical exercise we find 64 per cent. of suffering as compared with 67 per cent. in the other group. The lowest percentage is found in one of the normal schools and in a high school. Almost invariably the percentage of suffering is greater in the more exacting work or the study of more advanced classes than it was before in years of greater freedom; yet we find that from 65 to 70 per cent. enter the higher institutions of learning—normal school, college—and business with menstrual suffering of some kind, and, as a rule, this suffering increases in the mental and physical occupations here considered, with some few exceptions, and these are educational institutions where marked attention is given to physical training. Thus we find in one of the normal schools 54 per cent. in the junior and 53 in the senior class, the first having entered with 66 per cent. and the second with 71 per cent.; but the most marked exception is in the very youngest class in one well-conducted high school with an ad-

mirable system of physical training, where we find the most pliable and impressionable condition—the menstrual function barely established, and the slight irregularities which may have arisen yielding readily to excellent surroundings and judicious management. Here we find 42 per cent. in the junior class and only 32 per cent. in the same girls at the close of their senior year, some eighteen months after the first record. We have seen an aggravation of suffering with advancing grade, as much as 10 per cent., and yet more in normal than in high, more in college than in high or preparatory school, and yet in school and college a certain number record their general health as better, and this is as it should be, owing to the often improved habits of life and greater regularity. It must be noted that while the percentage of suffering is greater, severe suffering, as a rule, grows less. In one institution 18 per cent. suffered severely before, and only 10 per cent. during or after, entering upon the course. This is especially marked in the pupils of physical training schools. In the working girl, however, severe suffering increases, most so in the girl behind the counter, who stands most of the day.

The percentage of suffering may appear high, but it is nevertheless correct, as the figures are based upon large numbers and are moreover thoroughly confirmed by earlier records taken from other observers in other schools and even in other countries. De Boismont, in 1842, finds 77 per cent. of suffering; Mary Putnam Jacobi, from her statistics of 268 cases taken from the different walks of life, finds 46 per cent. who suffer more or less; 35 per cent. with no pain—in other words, 65 per cent. who might be classed in this group of those who suffer to some extent. Dr. Kennedy[33] found 78 per cent. in a Worcester high school; Dr. Tuckermann,[34] from 46 to 62 per cent.; but these are observations made under unfavorable conditions, and made on account of the apparent and general ill-health of the pupils in those institutions. In fact, 62 per cent. of suffering is among girls who had left school on account of ill-health; those who continued are noted with 57 per cent. The college alumnæ[36] by their records show 66 per cent. with menstrual irregularities, as compared to 53 per cent. during the earlier years of pubertal development, and state that organic trouble increased during college life from 24 to 36 per cent.

A certain confirmation of these figures is, moreover, found in the expression of the young women as to the increased difficulty of work, mental or physical, during the menstrual period,

and by the number who are excused from their regular duties at those times. We find this expression precisely where we should naturally expect it, where study is harder and looked upon more seriously, her future concerned, in the normal school, in the school for physical training, and in certain colleges; 83 per cent. in the senior class of one normal school find work harder, while only 69 per cent. so express themselves in the junior class. In one college, where the average age of students is greater, the girls older, more mature, 40 per cent. only find work harder at that time. In the normal school repeatedly mentioned, the division with more hours of physical training responds with 52 per cent. as contrasted with the other group with 60 per cent. The routine of daily duties during the menstrual period is clearly more trying to the girl at work, and it is again the one behind the counter, the one suffering most, who is most emphatic in expressing the increased difficulty of work during the period; 91 per cent. of the saleswomen so state, and an important pointer is given by the fact that those with sedentary occupation give 82 per cent., and those in every way most favorably situated, who have the privilege of moving about, only 78 per cent.

The results are, moreover, verified by the numbers of those who are unable to fulfil their routine duties and seek *excuses from work* or *study* during the menstrual period. I must say that excuse from physical training, from gymnastics and sports for three days, and more if necessary, is customary in almost all institutions; moderate exercise is allowed, but in the gymnasium the girl is not permitted on the floor, and nowhere does she continue her class work in the gymnasium.

Excuse from study or examination is not customary, but always sought by some. I have made the inquiry as to the number who are *habitually* and those who are *occasionally excused.* I find that very few are excused at every period, yet in one normal school as high as 20 per cent. and in one college 17 per cent., with respectively 40 and 14 per cent. occasionally excused. But in the first instance I would base no general conclusion upon these figures, because they are derived from a very limited number (fifty, I believe); 30 per cent. among all institutions may be considered a fair average of those occasionally excused from study, and the same percentage holds good for the working girl; 32 per cent. of the saleswomen, or, rather, those behind the counter, must occasionally give up work, and 25 per cent. of those

moving about, 26 per cent. of those sitting. Of the nurses, 14 per cent. are occasionally excused from lecture and recitation, and 17 per cent. from the physical duties of their work. When we find that the normal school girl, the nurse and working girl are forced to give up, we have evidence of considerable suffering.

Notwithstanding this high percentage of suffering, the increased strain of work, and the number excused, we find that the young woman is loath to give up her *amusements*, and that fully one-half, or 50 per cent., continue *pleasurable* exercise, no matter how severe, and dance, wheel, or skate regardless of the period. At least the responses indicate that they do not habitually or completely give it up, and answers come with remarkable unanimity from all groups and classes. It is very noticeable, however, that those who take life more seriously, and have already experienced the results of carelessness or neglect at that time, are those who avoid unnecessary exertion during the menstrual period—that is, nurses, physical trainers, and the older college girls.

Even *sports*, basket-ball, tennis, and other of the more active recreations, are followed by some. In one of the normal schools only 16 per cent. admit this, but 32 per cent. in some of the colleges, and in one normal school as high as 60 per cent. The variations in these responses, however, are too great to admit of deductions of any value, and, moreover, I doubt whether the question as to sports, a term so elastic in all it implies, is fairly understood, and understood in the same way; but it is evident that when a good opportunity for pleasure offers, hardly one-half of the young women are willing to deny themselves, and this, perhaps more than the strain of mental work, causes increase of suffering.

General health I cannot consider, because the question is too vague a one, and statistics do not exist in this country; but it is desirable to note the results of the very thorough Danish and Swedish investigations in regard to school girls, and I present them here (Chart V) for the purpose of showing the relation of morbidity—that is, of the minor ailments—to functional development, which is well marked; the time of highest morbidity being invariably in direct relation to the time of first menstruation, and varying with all correlated physiological factors, as has been shown, earlier in Sweden than in Denmark, earlier in city than in country (compare schools of all Denmark with those

of Copenhagen) (Chart VI), earlier and more marked in the girl than in the boy (Charts V and VI).

Then, again, the relation of morbidity to hours of mental work is clearly shown in Chart VII, adapted from Hertel, by a combination of his charts. Functional disturbances are not here especially considered, but the influence of mentality, of nerve strain upon the general system, is clearly apparent from the parallelism of the lines of increase in morbidity with increase in hours of study.

Résumé.—Statistics have clearly shown the tremendous susceptibility and the almost feverish activity of the system in the prepubertal period, the period of developing womanhood; susceptibility indicated by heightened morbidity, nerve excitement by increase of stuttering and hysteria; heightened physiological activity by increased growth and resistance to disease, by lowered mortality; all gradually wane as the vital energies are claimed more and more by the reproductive fuction, and reach their lowest ebb with the advent of puberty, again rising after menstruation is established, and it is at this period of still unstable equilibrium that we find the school girl.

Similar conditions, less intense, recur before each menstrual period. Investigation has proved the increased pulse rate, blood tension, and temperature, increased nerve excitability and muscular power, with a depression consequent upon the appearance of the flow, the system slowly regaining its normal tension with slight rise shortly after cessation; and these scientific facts are verified and emphasized by the status of young womanhood of today, which reflects the present conditions of life and indicates the susceptibility of the physiological function in the early years of puberty and during menstruation.

These conditions are not what they should be, as I have amply shown by records of large numbers, not from hospitals or the case books of physicians, but from educational institutions of the highest type and leading business houses—I might almost say from selected types, from those engaged in active pursuits and best fitted, mentally and physically, to cope with the problems of modern life.

The numbers and the intelligence of those examined are such that we must accept the data, and accept, too, the fact that unfavorable conditions, that suffering, irregularity, and impediment to work, are never thoroughly revealed; they are always likely to be below the true mark by reason of the inherent unwillingness of women to admit imperfections of this nature.

There can be no question as to the marked depression which follows the heightened activity of the system before puberty and before each menstrual period; observations of various kinds demonstrate this physical excitation and the subsequent relaxation during the first days of the flow and during the first year of puberty, covering the time of high and college preparatory schools. Intellectual vigor follows the same lines, and mental energy and acumen are, as a rule, diminished during the first days of the flow at least, as is affirmed by perhaps 65 per cent. of the many questioned, who state that mental exertion, study, at that time is more difficult and wearing and requires greater effort, precisely as the working girl—only in a larger proportion of cases, 75 per cent.—expresses impaired ability for work, saves herself, and relies upon her mates to complete some part of her task.

This mental depression is evident in the listlessness, indifference, and inability to master tasks easy at other times, noted by every observant educator as indicating the presence of the flow and the period of its first advent; similar conditions, less clearly defined, mark pubertal development in the boy. Over-strain more readily occurs, the powers of attention and concentration are more quickly exhausted, and the brightest mind, the most sensitive, high-strung, nervous organization, is as a rule most responsive and most liable to impairment during the menstrual period.

Under normal conditions the physical changes which so deeply affect the female organism powerfully influence the mental equilibrium of woman. In the healthy and vigorous we frequently find the nervous system in a state of great excitability during menstruation, which does not, however, pass beyond psychical limits; but in the nervous system less strong this often develops symptoms which are pathological, and the connection between menstruation and mental status becomes pronounced.

I cannot here enter into the question of cause and effect; the correlation exists especially in certain forms of mental disease which are so frequently concomitant with amenorrhea. The examination of 705 cases by Schaeffer[37] shows interference with the function in 69 per cent. of cases of melancholia, primary dementia, and acute paranoia, with total cessation in 40 per cent.; while the forms of moral insanity and chronic paranoia show an irregularity of only 44 per cent., not more than might ordinarily be expected. In many cases the menstrual irregular-

ity initiates the advent of mental disturbances. Insane impulses are certainly more marked at this time, the melancholic are more depressed, the maniacal more restless, hallucinations more intense, and impulses more uncontrollable. In short, control and endurance, mental and physical, are lessened at the period, even in the healthy, and Ellis[38] truly says that in any test of skill or strength everything must depend on woman's position in her monthly cycle. The difference of a few days will greatly affect the result.

Conditions of mental vigor I cannot here statistically prove, but we must admit, to say the least, an impairment of equilibrium, a condition of excitability and instability during the great waves of female life; and we must admit, too, that the condition of the American girl at the present day is not what it should be under the unusually favorable conditions of her life in what is justly hers by the splendid heritage of health to which she is entitled. Menstrual suffering we see in from 50 to 80 per cent.—averaging, perhaps, 65 per cent.; menstrual irregularity in from 45 to 55 per cent., and the period more generally retarded. Amenorrhea is frequent in the first year of college or school, with removal from parental roof or previous surroundings; but this interference with the flow upon change of surroundings is but temporary, and must not be ascribed to study, to mental strain direct, but to the general influences of school or college life. I often see it among immigrants; it is an emotional amenorrhea, and described by the French as such, as the "amenorrhea of the pensionat," or the amenorrhea of the convent—"des religieuses"—and seems to be harmless if reasonable precautions are taken; without injurious effect if the girl is properly cared for, well fed, and not mentally or physically overstrained. This cessation of the flow is an effort of Nature to prevent waste and husband strength which has been successfully followed in practice in the management of debility and chloranemia (Löwenthal,[39] Gehrung[55]). On the contrary, the amenorrhea due to violent emotion and to physical causes, to cold, has a most deleterious effect, resulting in mental and physical injury and often crippling for life.

Functional disturbances are least in the first years of pubertal development in the high school, increasing with each year, increasing in the normal school and college, increasing with intensity and seriousness of work; in one institution we see an aggravation from 69 per cent. to 70 per cent. in the freshman class,

and to 80 per cent. in the higher classes. This is not the effect of brain work alone, but of all the conditions, mental and physical, of school life, the resultant of concomitant circumstances, as is shown by the widely differing conditions in various institutions; but the dependence upon school life is distinctly characterized by increase of suffering, more frequent recurrence, from 18 to 25, and even as often as once in fourteen days, toward the latter part of the school year, with return to the normal in vacation, usually recurring with the resumption of fall work, but certainly with the tire which comes toward the close of the session in spring.

The younger the girl, the nearer the period of puberty, the more impressionable the system, the more susceptible to influence for good or evil, and most harm is wrought in the first year of functional life.

The majority of those who, after the high school period, enter upon physical work, date their suffering to the fourteenth year —that is, during their school life. One-half as many only are free from pain until their seventeenth year (this is the average), when the influence of steadily continued exertion is marked upon the function. After this time little change takes place; it is evident that in later years, with the function well established, minor causes no longer disturb, and only more violent or constant exertion causes derangement.

The increased susceptibility to injury, mental and physical, during the menstrual period itself, is too well established by the observation of every practitioner to need verification here, and upon this I have sufficiently dwelt in my address on the health of the American girl.[40] Striking cases of functional disturbance from examination, hard study, and emotion at that time abound; but these I will not here dwell upon, as I confine myself to the statistical data presented.

That the aggravation of these conditions is to a great extent due to nerve influence is evident, ignoring my own observations, from the report of the Alumnæ Association, 1885, noting an increase of functional derangement from 53 per cent. in the earlier years to 66 per cent. during college life, and, what is noticeable, diminishing to 64 per cent. in after-years, notwithstanding the dangers of marriage, and work by a certain percentage dependent upon their own energies for support. Organic troubles are shown by the same authority to increase from 24 to 36 per cent., remaining at this point in after-life, and general health as de-

teriorating 19.6 per cent. as compared with 16 per cent. in the working girl (1,032 cases).*

This deterioration in health, general and functional, in the college girl is not the natural accompaniment of increasing years, as is proved by a comparison of her condition with that of the working girl. It is distinctly a sequence to college life, directly and indirectly, not due altogether to mental strain, but to the combined influence of habits of life and methods of training. This comparison is instructive, though unjust to the working girl, and I refer to it because it has been made to show that the influences of school and college life are no more deleterious to the peculiar organization of woman than those to be encountered in other occupations and even in the active pursuits of life. It is unjust, because the sole aim and object of the one is the development of all powers and faculties, guided by instructors whose duty it is to perfect this development and correct faults physical as well as mental. The other is engaged in the struggle for existence, and in the keen competition of the day must expect wounds, however the humanitarian may seek to guard her.

An able colleague[42] presents existing conditions rather forcibly and pointedly, but well, when he says "that the American horse receives on the average better treatment than the young woman of America from the time of early girlhood until the age of development has passed. The stock-breeder never forces the young animal during the period of development, realizing that it is the time the greatest care should be taken; while American parents, especially of the middle classes, with great ambition for their children and the desire that they develop intellectually beyond their own standard, allow their heads to be crammed with knowledge so rapidly that the brain cannot assimilate it, and the result is that all strength of development is devoted to the brain, and physique finds expansion as best it can—New England furnishing the extreme type of this woman, supposedly more perfect than in any other section, intellectually above the average, but with a physique below par, with greatly reduced reproductive powers, all due to the forcing of study at the age of development." The same observer adds that he finds the perfect-

* I regret much that a statistical investigation just made by the Associated Alumnæ of American Colleges, and preparing for the Paris Exposition is not yet in print and available for comparison, as indicating now existing conditions, although in this investigation no record is made of menstrual condition and functional health.

ly developed woman a rarity among teachers who have reached adult age—that is, among those who have been under the influence of present educational methods to their full extent.

Control and Prevention.—Betterment. That the unfavorable conditions of functional health which I have shown to exist are amenable to control and betterment, and, in fact, are now being bettered, is evident by a review of the statistical data here given, which at the same time indicate the method available for improvement.

The alumnæ records of 1885 show a deterioration in functional health during college life of 13 per cent.; my own of today, with the exception of one very small group, reveal much better conditions; the deterioration is slight, in one institution unchanged or with an improvement of 0.2 per cent., in another of 10 per cent., and this decided change for the better is due in the main, I believe, to the greater attention given to sports and physical training. The effects of gymnasium work are shown by improvement or lessened deterioration in the freshman year, to which, for the present, physical training as a compulsory study is limited, with the exception of one institution in which this extends throughout the sophomore year, and with it the accompanying betterment of health; but by the end of the senior year the girls have slowly returned to about the same state of health at which they entered, which is not good, as I am told by the observing instructor in physical training, not merely as a vague general estimate, but the result of careful study and records throughout a number of years.

Functional and general health is likewise better, and capacity for study increased, in the small group of those who continue physical training as an elective study throughout the later years of college life.

These facts are corroborated by a comparison of the two groups of the normal school which show less suffering, greater regularity, and, I am informed, greater power of application in those devoting more time to gymnastic work. Equally instructive is the improvement in a normal school from 54 per cent. at the beginning of the junior to 53 per cent. in the middle of the senior year, a result accomplished amid most unfavorable surroundings and in the absence of proper facilities, by enthusiastic instructors, with attention to physical training in its broadest significance—attention to all that concerns the physical welfare of the girl. The possibilities of properly directed physical training are

even more positively shown by the records of the high school, with an improvement of 10 per cent., from 43 per cent. in the junior to 32 per cent. in the senior year. All conditions in this school are more favorable, the girl is younger, the system more readily influenced, the building modern, light and airy, stairs few, with a roomy, well-ventilated hall for gymnastic work.

Attention is given to dress by the instructors in both institutions, and it is interesting to note that while in the former 47 per cent. of the girls enter wearing corsets, these are given up, in consequence of advice and teachings of the instructors in physical training, for boneless waists, so that in the senior year we find only 30 per cent. still retaining the corset. In the latter the results in this direction have been less satisfactory. The high school girl is younger and less inclined to yield this supposedly womanly privilege of wearing the corset, and while only 27 per cent. enter with it, it is apparently assumed as an evidence of development, and is worn by 58 per cent. in the senior year, regardless of the representations of an energetic and popular instructor.

These facts may suffice to indicate the lines to be followed and to show in how far, from the data here presented, improvement in the functional health of the American girl is possible, under present educational conditions; that this may be accomplished by greater attention to physical training, not gymnastic work alone, but physical training in its broadest sense, which should be compulsory throughout all school and college life, not only after functional development, but in the important formative, prepubertal period as well.

Physical training begun in early life, the habit of exercise, will do much to remove the susceptibility to injury during the physiological fluctuations of the functional wave, as we are taught by the acrobat, who, under constant training from childhood on, persists in her trying feats, requiring the greatest nerve and muscle strain and the highest co-ordination of all powers throughout every functional change, unaffected by the menstrual period.

Improvement is possible in the functional health of school and college girl, but more difficult are suggestions as to a feasible course for betterment of conditions in the working girl, as the laws of necessity, of supply and demand, too greatly overshadow all other claims. Prevention by self-knowledge, and a regard for woman's functional organization as far as the exigencies of business will permit, offer the only solution.

Prevention. Better far than the remedy of damage done and the relief of suffering already established is its *prevention,* and prevention is above all essential and possible in the impressionable, formative years of the pubertal period, the period of school life. The point of attack is clearly indicated by the identity of increase in morbidity with increase in hours of study[43] (Chart VII), and by the scientific facts and statistical data which indicate the instability and susceptibility of the system during the functional wave.

The *solution* is in reasonable hours of study, *in mental training adapted to physiological possibilities,* and *a regard for the claims of woman's sensitive organization,* for the reproductive function, and this we in this enlightened nineteenth century tend to undervalue and to ignore.

The girl pays the penalty and the community suffers.

We know nothing of that functional hygiene which was so fully appreciated by the nations of former ages and is today recognized by all primitive peoples to such an extent that it was made obligatory by laws of custom or religion, and the highest penalty imposed for the transgression of these laws—transgressions which are thoughtlessly practised by the progressive and enlightened minds of our advanced civilization.

We hear of the vigor of the savage woman, of her capacity for work, her ability to follow the warrior on the march, and *why is this?*

It is because she is judiciously cared for during every period of functional life, and this care is given to woman by primitive peoples of every race, of every color, in every clime.* It is the teaching of intuition, the instinct of self-preservation, which recognizes the importance of the function, lost only among the very lowest tribes in whom the attributes of woman begin to disappear and even the frame approximates that of the male. These were the teachings of the great lawgivers—Moses and Zoroaster—and where religious law did not command, custom, equally potent, prevailed, enforcing rest and abstinence from labor and the daily routine work. So essential did rest seem, and, what is more, rest in the recumbent position, that among some peoples we find the hut for the menstruating woman so low that the upright position was impossible; she was obliged to lie down.

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* **Engelmann: "Labor among Primitive Peoples;" Ploss-Bertels: "Das Weib."**

The advent of puberty was celebrated as an event of great importance in the life of the girl, and rest for some months was enforced, for a longer time by those who could afford it, among the more prominent and powerful, less among the more lowly and poor. The uncleanliness taught by religious precept was the pretext, but rest was secured, as it was secured at each subsequent period. The isolated tepee for the menstruating woman is marked in the traces of almost every Indian village which remain, and among savage and semi-civilized people the world over this attention is given to the demands of woman's physiological function—a very different course from that pursued in our nineteenth-century civilization.

I have sought to present conditions as they exist; that they are not what we have a right to expect is apparent; the *cause* is, to a great extent, a misdirected refinement of civilization—*ignorance of* and *disregard of the function,* the crushing out of every question of sex in the girl, who soon learns to ignore, conceal, and deceive.

The *first step toward betterment* is knowledge—*a knowledge of woman's functional life,* its conditions and requirements; an understanding of its nature by physician, educator, and mother, by the girl herself, and to her it must come from the mother. This is due to a regard for the sensitiveness of the young girl and the mental suffering she undergoes when she is brought face to face with this epoch in her existence and at every period throughout her functional life; but she must know, and know in the right way, as has been well said,[44] "that her mind may be freed from disturbing thoughts in this direction and from the morbid tendencies often resulting from half-knowledge, the prurient knowledge imparted by precocious playmates.

Upon the *mother* I would impress that perfect development of the female function, and maintenance of this function once developed in a healthy condition, is essential to perfect development of the girl and perfect health of the woman; that self-care, a well-regulated female hygiene, is the foundation of her well-being, and that it is the mother's first duty so to guard herself and so guard her daughter.

To the *educator* I would say that heed must be given the instability and susceptibility of the girl during the functional waves which permeate her entire being; that emotional stimulation must be avoided, and decided concessions must be made to the depression, physical and psychical, the lessened inhibition

and physiological control during the fluctuations of puberty and menstruation.

Upon the *physician* I would urge care and guidance of the girl during the great waves of female life, those periods of increased susceptibility and of physiological intensification and depression; and such care is the first and essential step in preventive gynecology.

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The data upon which this investigation is based have come from many sources, from every section of the country, representing various forms and grades of mental and physical work during the developmental period of puberty and adolescence. I have treated the subject from a purely scientific standpoint, classifying all pupils of like grade together, *recognizing no individual institution,* only similarity of conditions, and *mentioning no names,* as this might lead to invidious distinction and criticism, and being moreover especially requested not to do so by many to whose interest in all that bears upon the health of the girl I owe the facts which enable me to present conditions as they exist, and which may tend to throw light upon the causes which produce them, the causes which interfere with the most perfect functional development.

I regret that I cannot here, by reason of this very request, convey my acknowledgments to all those to whom I am indebted for valuable contributions, but I do wish to express my appreciation to the presiding officers of institutions in every part of this country who have accorded me the privilege of utilizing the observations made among pupils under their jurisdiction, and above all to the directors and instructors in physical training whose work has already done so much to improve the physical condition of the American girl. Without their co-operation, generously and enthusiastically accorded, this investigation would have been limited to narrow fields indeed. I am indebted to them, too, for investigations made at my request, and, while I am not at liberty to mention names of those giving data bearing upon institutions with which they are now connected, I can at least express my recognition of the interest shown and the assistance accorded by Dr. Thomas D. Wood, professor of hygiene and organic training, Leland Stanford University; Dr. Eliza W. Mosher, dean of the Woman's Department, University of Michigan, who has done so much in the cause of woman's health; Miss Anne M. Barr, instructor and director of woman's gymnasium, University of Nebraska; Miss Lura W. Sanborn, formerly of the

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Broad-minded, progressive business men intent upon the welfare of their employees—Mr. Eben Jordan, Mr. John Shepard, of Boston, and Mr. John Wanamaker, of Philadelphia—heads of the great firms which bear their names, have enabled me to throw some light upon the conditions existing among the self-supporting, and whatever beneficial results may accrue from this investigation they are due to those who have made it a possibility.

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REPORTS FROM SOCIETIES.

BOSTON PHYSICAL EDUCATION SOCIETY.

The annual meeting of the Society was held December 13, 1900, Dr. Lovett presiding.

Miss Mary G. Cannon, 63 Highland avenue, Newtonville, was elected to membership.

The following were elected officers for the coming year:

Dr. R. W. Lovett, President.

Dr. John Bapst Blake, 1st Vice President.

Dr. Mary Rees Mulliner, 2nd Vice President.

Miss Sarah S. Webber, Secretary.

Miss H. E. Hutchinson, Treasurer.

Additional members of the Executive Committee: Miss Jennie M. Colby, Mr. Hartvig Nissen, Dr. George L. Meylan.

Miss Lillian M. Towne reported for the public school section of the Physical Education Society, the work of the section in collecting statistics of positions of school children. *

Miss Gordon, of Gloucester, gave a sketch of the value of physical education in the school room. She considered that many ills resulted from the heterogeneous collection of shoes worn by children. To remedy this, they are helped to make simple moccasins, and great improvement is noted from their use.

In discussing the papers, Dr. Sargent considered that frequent changes of position were absolutely necessary, both for children and adults.

*See page 20 of this number.

Dr. J. S. Stone queried whether the occupations that cause bad positions came early or late in the day, and if the children who are over or under size assume more often the bad positions? He advocated much smaller classes, with selected teachers, for defective pupils.

Dr. G. W. Fitz suggested that lack of endurance may be the cause of such bad positions.

Dr. S. G. Webber thought there should be time between reci-

tations for rest, change of position and light exercise. The home positions may be responsible for those assumed at school.

Baroness Posse, Dr. D. F. Lincoln, Mr. Nissen and Mr. Eberhard participated briefly in the discussion.

MARY REES MULLINER,
Secretary.

The forty-second meeting of the Boston Physical Education Society was held in the Institute Building, January 10, 1901, Dr. Lovett presiding.

The minutes of the last meeting were read and approved.

The reports of committees were as follows:

The Committee on Publication and Bibliography, Miss Towne, chairman, reported that a list of books or publications on Physical Training found in Bates Hall, Boston Public Library, had been made; that the Library authorities were willing to coöperate so far as they could in increasing the use of such publications and suggested that the list should include similar publications to be found in the large libraries in New York, Chicago and Philadelphia. They recommended: that the society, through its Committee on Bibliography, undertake to prepare and publish in the AMERICAN PHYSICAL EDUCATION REVIEW (for reprinting) a bibliography of physical training. In answer to Dr. Mulliner's question, Dr. Fitz thought the expense would not be more than fifty dollars. The report was adopted.

The local Outlook Committee, Miss Colby, chairman, reported that the committee is making an effort to canvass the state of Massachusetts for the purpose of ascertaining where there is an interest in physical education or training and what form such interest takes, the results to be expressed on a geographical chart which shall show the extent, location and character of our work in our own state. One chart is to be kept by the general secretary of the society, and another by the chairman of the committee. They desire coöperation from members.

Dr. W. H. Ensworth and Mr. Thomas Brown were elected members of the Society.

Mr. J. E. Doldt, physical director of Rhode Island State Normal School, Providence, R. I., addressed the Society upon "Methods of Instruction by Chart."

To represent the feet he uses circles with shadings for the toe and heels, darkness and lightness of the shading shows greater

or less pressure, and no shading shows foot raised. A straight line in front of the circle indicates that the knee is bent. He represents a measure of music by a square divided by parallel and diagonal lines crossing in the centre. Feet circles are placed on the lines at the centre and changes of position are indicated by change of position of circles connected by red lines. Direction of movements, forward, backward, sideward, etc., are indicated by straight lines in the square. Arm and forearm movements are indicated by short lines and arcs of circles in the squares. Body is indicated by large circle; head by a dot or small circle.

Mr. Nissen spoke very favorably of Mr. Doldt's work, having seen examples of it in Providence. The class worked with precision and accuracy.

Mr. Gilbert said that he did not agree with Mr. Doldt in regard to the value of charts; that a poor teacher would not get the same results as Mr. Doldt; they would not interpret the chart the same. A number of teachers have proposed methods of instruction by chart, but they have not been generally adopted. One serious objection to charts is that all movements of feet, arms, hands, body and head, which are made together, cannot be expressed on the chart, and it is the graceful combinations of all these movements in all their variations which constitutes perfection in dancing. He hoped that Mr. Doldt would continue his study and perfect his system.

Mr. Doldt closed the discussion, saying that if in music five lines with the notes on them expressed music for the pianist, so charts can be formed to express movements. Each pianist interprets the music according to his ability, so each teacher interprets the chart in movements according to his ability.

Dr. George L. Meylan, physical director of the Boston Y. M. C. A., spoke on the "History of Physical Training in the Young Men's Christian Associations of America." He said that when gymnasiums were first introduced into the Y. M. C. A. there was much opposition on account of their being associated with athletes, prize fighting, and professional gymnasts. Others believed that gymnasiums and bowling alleys were associated with saloons and other evil influences, so they opposed them. It took four years to get them into the associations. In 1860 gymnasiums were officially adopted.

Dr. Meylan showed by charts the advance in favor of gymnasiums from that time to the present, when there are 77,000 members in the United States and Canada, 266 physical directors,

297 gymnasiums, 577 associations doing physical work. The first gymnasiums connected with association buildings were opened in 1869 in New York, Washington, D. C., and San Francisco, Cal. He briefly reviewed the work of Mr. William Wood, for 25 years instructor in the New York Y. M. C. A. gymnasium, and Mr. Roberts, in Boston, mentioning the rise of opinion in favor of short, simple and light exercise, with cold bathing after. Boston and New York were the first to introduce medical directors. He spoke of the organization of normal schools of gymnastics to train physical directors, the organization of outing clubs and camps, the introduction of gymnastic games and volunteer instructors.

SARAH SOUTHWORTH WEBBER, Secretary.

NEW HAVEN PHYSICAL EDUCATION SOCIETY.

The regular monthly meeting of the New Haven Physical Education Society was held Friday evening, February 1, 1901, at the Yale Psychological Laboratory.

Dr. W. G. Anderson, of Yale University, gave an illustrated lecture on "Physical Culture in America," which was greatly enjoyed by all present.

A meeting of the Society was held Tuesday evening, March 12, 1901, at the Yale Medical School. President Leyerzapf introduced Dr. C. J. Bartlett, who gave an interesting and instructive lecture on "Bacteria—Their Microscopic Appearance and Growth." Cultures were shown and the methods of obtaining them explained, also several slides were shown by the aid of the microscope. The lecture was thoroughly enjoyed by all.

A business meeting was held at the close of the lecture. The minutes of the last two meetings were read and accepted; also the treasurer's report.

Dr. Seaver suggested that the secretary collect the dues for the year and send them to Dr. Fitz. The name of Miss Mollie Benton was proposed for membership, and referred to the council. A motion was made and passed that three delegates be elected to represent the Society at the National Convention. The following were chosen: Dr. E. H. Arnold, Dr. J. W. Seaver and Mr. Louis Leyerzapf. Dr. Seaver suggested that the constitution be discussed at the next meeting so as to instruct the delegates.

A motion was made and passed that the next meeting be held

before April 12th, to open a quarter before eight, and that election of officers should take place.

The meeting then adjourned.

LAURA K. HILLS, Secretary, pro tem.

New Haven, Ct., March 14, 1901.

PHYSICAL EDUCATION SOCIETY OF NEW YORK AND VICINITY.

The annual meeting of the New York Society was held at the Dr. Savage Institute, New York, on December 15th, 1900, Mr. J. Blake Hillyer, president, in the chair.

The minutes of the last meeting having been read and confirmed, the secretary read his report as follows: Number of meetings during the year, 8; average attendance, 37; executive committee meetings, 9; average attendance, 6; number of members January 1, 1900, 104; resigned during year, 6; dropped for failure to qualify, 6, leaving a total of 92; new members elected during year, 18; total now on roll, 110.

Five of the meetings were devoted to the reading of papers by Mr. O. H. Lang, Dr. E. H. Arnold, Dr. W. G. Anderson, Dr. Luther Gulick and Mr. Nils Bergquist. Three meetings were devoted to general discussions on: experience in teaching of all kinds; equipment for home exercise, in which several of the leading manufacturers or inventors of pulley weights, punching bags and the like were present with their goods to demonstrate the use of the same, and the annual meeting.

One of the most important features of the year's work has been the public demonstrations of work done by various classes all over the city, arranged for by the chairman of the special Exhibition Committee, Dr. H. L. Taylor, which have been well attended and interesting.

The treasurer reported: Cash on hand January, 1900, $79.31; dues and entrance fees, $219.00; total, $298.31; paid dues to National Society for members and general running expenses, $209.81, leaving a balance on hand of $88.50. Both reports were accepted. The librarian, Mr. Alexander E. Wilson-Barker, reported books in library 45, with a number of pamphlets and papers. The following members presented books: Dr. Taylor, Miss J. H. Bancroft, Dr. W. L. Savage, Mr. Albert Turner, Miss E. Fletcher, Mr. Alexander Barker and Messrs. Heath & Co., of Boston.

Dr. Truslow gave a brief report, representing the Technical

committee. Dr. Taylor gave a report from the Exhibition Committee, and it was decided to continue it in its present state.

The Nominating Committee for the Convention reported as follows: Dr. Savage, Dr. Fitz, Dr. Gulick, Dr. Wallin, Dr. Taylor, Dr. Scholer, Miss J. H. Bancroft, Miss MacMartin and Mr. J. Blake Hillyer, and the above were duly elected.

The election of officers for the coming year then took place, with the following result: President, Dr. Walter Truslow; 1st Vice President, Dr. Elias G. Brown, 2nd Vice President, Miss K. B. Peck; Secretary-Treasurer, Mr. Alexander E. Wilson-Barker, with Mr. F. H. Cann, Dr. Louis R. Welzmiller, Miss J. Beiderhase and Mr. Emmanuel Haug.

The president, Mr. Hillyer, then read his annual report, and a cordial vote of thanks having been given the retiring officers, the meeting closed.

ALEXANDER E. WILSON-BARKER, Secretary-Treasurer.

REPORTS OF THE COUNCIL.

At the December meeting of the Council of the A. A. A. P. E. there were present: Drs. Hitchcock, Fitz and Mulliner, Mr. Eberhard, Miss Narey and Baroness Posse.

In the absence of the president, Dr. Hitchcock took the chair. The reports of the secretaries and treasurer were read.

The treasurer reported: Balance on hand, as per report of November 2, $136.53; received during interval, $105.10; total, $241.63; paid, $191.42; leaves balance this day of $50.42.

The new members elected were: Miss Jean Kendrick, South Nashville, Tenn.; Miss H. Frances Morse, London, England; Miss Helen M. S. Sanborn, Oneonta, N. Y.

January 1.—Present: Drs. Sargent, Hitchcock and Fitz, Mr. Eberhard and Baroness Posse. The reports of secretaries and treasurer were read. The treasurer's report to date (January 4, 1901) is as follows: Balance on hand, as per report of January 7, 1900, $50.42; received during interval, $51.55; total, $101.97; paid, $26.86; leaves balance on hand this day, $75.11.

The corresponding secretary reported total receipts for the year 1900, $967.58; expenditures, $434.41.

The membership for 1900 shows 703 in good standing, including 159 who have not yet paid for 1900.

During the year 110 new members were elected, 250 were dropped and 13 resigned.

It was voted that the full report of the corresponding secretary be published.

Miss Emma A. Vinton, Atlantic, Mass., and Mr. A. Tooley, Brockport, N. Y., were elected members, and Miss Emily C. Smedley, E. Orange, N. J., was re-elected after an interval of non-membership.

Adjourned.

BARONESS ROSE POSSE, Recording Secretary.

February 1.—Present: Drs. Sargent, Hitchcock, Mulliner and Mr. Eberhard. Dr. Fitz, who was ill, was represented at the meeting by Mrs. Fitz.

The Corresponding Secretary reported receipts for January, $145.25; expenditures, $46.14.

The following candidates were admitted to membership: L. J. Cooke, M. D., University of Minnesota, Minneapolis, Minn.; Thomas Brown, Y. M. C. A., Cambridge, Mass.; Prof. A. G. Douthill, Y. M. C. A., Seattle, Wash.; E. E. Green, University of Rochester, Rochester, N. Y.

The treasurer reported no change in the treasury since previous meeting. Dr. Hitchcock moved that a committee be appointed in accordance with the request of the New York Physical Education Society to draft a revision of the present constitution of the A. A. A. P. E. Motion accepted.

Dr. Hitchcock further moved, that the committee consist of five members, including the president, Dr. Sargent. Motion accepted. The committee is composed as follows: Dr. Sargent, Dr. Fitz, Dr. Mulliner, Dr. Seaver and Miss Narey.

Upon motion, it was voted to allow out of the treasury $150.00 as a maximum contribution toward meeting the expenses of the coming convention at New York, this sum to include necessary payments for stenographic reports for the AMERICAN PHYSICAL EDUCATION REVIEW.

The corresponding secretary was requested to notify the chairman of the standing committees that a report from them will be expected at the convention.

The president, Dr. Sargent, reported that the committee of nineteen is now duly organized, with President Hyde, of Bowdoin College, as chairman, and Dr. Hartwell, of Boston, as secretary. Dr. Sargent also announced that this committee will not be ready to report at the next convention, but hopes to do so at the one following.

Meeting adjourned.

CHRISTIAN EBERHARD, Recording Secretary, pro tem.

March.—Present: Dr. Sargent, Dr. Fitz, Dr. Mulliner, Mr. Eberhard, Miss Narey and Baroness Posse.

The reports of the secretaries and treasurer were read.

The treasurer reported: Balance on hand, as per report of January 4, 1901, $75.11; received during interval, $191.31; total, $266.42; paid, $185.02; leaves balance on hand this day, $81.40.

The following were elected to membership: Mildred J. Levy, Avondale, Cinn.; William H. Ensworth, M.D., East Boston, Mass.; Eckhardt Keller, Norwood, Ohio.

It was moved and seconded that five hundred copies of Dr. Engelmann's address be printed. Voted. It was voted that the size of the edition of the March REVIEW be left to the Committee on Publication.

It was moved and seconded that the matter of reporting the convention be referred to the Committee on Publication. Voted.

A copy of the preliminary programme of the April convention was read and approved. Adjourned.

BARONESS ROSE POSSE, Recording Secretary.

OFFICIAL ANNOUNCEMENTS.

PRELIMINARY PROGRAM OF THE SECOND NATIONAL CONVENTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF PHYSICAL EDUCATION. APRIL (17TH) 18TH, 19TH AND 20TH, 1901. NEW YORK CITY. HEAD-QUARTERS: MURRAY HILL HOTEL, PARK AVENUE AND 40TH ST.

Wednesday, April 17th.—Visitation and inspection of schools, gymnasia, clinics and playgrounds. (A detailed list of the same will be published in the final program.)

Wednesday Evening.—Reception to delegates, members and guests, by Miss Butler and Dr. M. K. Wallin, 78 Park Avenue, corner 39th Street.

FIRST SESSION.

Thursday, April 18th.—Hall of the Board of Education, Park Avenue and 59th Street:

9.30 A.M—Opening of Convention by the President.

Address of Welcome, the Hon. Miles M. O'Brien, President of the New York Board of Education.

Response and Address by the President of the A. A. A. P. E., Dudley A Sargent, M.D., Harvard University.

Organization of Convention.

Reports of Officers and Committees.

Other Business.

The Exhibit of the New York Public Schools, as shown at the Paris Exposition, M. Augusta Requa, M.D., Supervisor Physical Training, Boroughs of Manhattan and the Bronx.

Library Exhibit, Luther Gulick, M.D., Pratt Institute.

1 P.M.—Luncheon.

3 P.M.—Afternoon Session, Hall of Board of Education.

Section Meetings:

I. Colleges and Secondary Schools, R. Tait McKenzie, M.D., Chairman, McGill University, Montreal, Canada.

(a) The Place and Value of the Physical Examination on Entering College, R. Tait McKenzie, M.D.

(b) Mental and Physical Culture in Higher Schools, Frederick J. Simpson, M.D., Hartford, Conn.

(c) A Gymnastic Glossary, J. H. McCurdy, M.D., International Y. M. C. A. Training School, Springfield, Mass.

(d) Effect of Athletics on Growing Boys, Watson L. Savage, M.D., Columbia University.

(e) The Value of Athletics among College Girls, Miss Harriet I. Ballantyne, Vassar College.

(f) (Subject and speaker to be announced.)

II. Elementary Schools, Miss Jessie H. Bancroft, Chairman, Director of Physical Training, Public Schools, Brooklyn, N. Y.

(a) Some Results of the Study of Hygienic School Desks and Chairs, Edward R. Shaw, Ph.D., Dean of the School of Pedagogy, New York University.

(b) The Importance of Hygienic Seats and Desks for School Children, Eliza M. Mosher, M.D., Dean of the Woman's Department, University of Michigan. (Read by Miss Ada F. Thayer, Director of Physical Training, Public Schools, Syracuse, N. Y.)

(c) Presentation of New Hygienic School Furniture, by the above, and by James B. Fitzgerald, M.D., Director of Physical Training, Boston Public Schools; Professor E. W. Miller, Massachusetts Institute of Technology, Boston, Mass.; Mr. John G. Thomson, Principal, State Normal School, Fitchburg, Mass. (Represented by Mr. C. S. Alexander, Principal of Model and Practice Schools, Fitchburg, Mass.)

(d) Children's Games in the Andover Public Schools, Mr. George E. Johnson, Superintendent of Schools, Andover, Mass.

(e) The Hygiene of Instruction, Stuart H. Rowe, Ph.D., Supervising Principal, Lovell District, New Haven, Conn.

8 P.M.—Evening Session, Hall of the Board of Education.

Address, William H. Maxwell, Ph.D., City Superintendent of Schools, New York City.

Moving Pictures (as shown at the Paris Exposition) of Physical Training, Manual Training, Fire Drills, Assembly and Dismissal, etc., in the Public Schools of New York, Alfred T. Schauffler, Ph.D., Assoc. Superintendent of Schools, Boroughs of Manhattan and the Bronx.

The Facial Expression of Strain, Breathlessness and Fatigue (illustrated). R. Tait McKenzie, M.D., McGill University, Montreal, Canada.

Friday, April 19th.—Fayerweather Hall, Columbia University, 116th Street, between Amsterdam Avenue and Broadway.

9.30 A.M.—Section Meetings.

I. Anthropometry, Franz Boas, Ph.D., Chairman, Columbia University.
  (a) Value of Statistics to the Anthropologist, Franz Boas, Ph.D.
  (b) Value of Statistics to the Physiologist.
  (c) Value of Statistics to the Psychologist, J. McKeen Cattell, Ph.D., Columbia University.
  (d) Value of Statistics to the Physical Educator, Edward Hitchcock, M.D., LL.D., Amherst College.

II. Elementary Schools, Miss Jessie H. Bancroft, Chairman.
  (a) Action as a Condition of Mental Growth, Charles H. Judd, Ph.D., Professor of Physiological and Experimental Psychology, School of Pedagogy, New York University.
  (b) How Time May be Found in the Curriculum for Adequate Physical Training, Samuel T. Dutton, Professor, School Administration, and Superintendent of Teachers' College Schools, Columbia University.
  (c) The Waste of Time in Teaching the 3 R's, J. M. Rice, Ph.D., Editor of the "Forum."
  (d) Physical Examinations of School Children, George Wells Fitz, M.D., Boston, Mass., Editor of the American Physical Education Review.

III. Normal Schools, J. W. Seaver, M.D., Chairman, Yale University.
  (a) A Plea for More Instruction in Theoretical Topics in Normal Schools, J. W. Seaver, M.D.
  (b) Admission Requirements and Courses of Study for Normal School. Report of Committee of Nine.

Discussion by representatives of the various Normal Schools of Gymnastics.

(c) Recording and Charting Cases of Scoliosis. Walter Truslow, M.D., Brooklyn, President, Physical Education Society of New York and Vicinity.

(d) (Subject and speaker to be announced.)

Luncheon at Columbia University.

Afternoon Session, 3 P.M.—Schermerhorn Hall.

General Meeting.

Address, Dean J. Howard Van Amringe, Ph.D., LL.D., Columbia University.

Effect of Maximal Muscular Effort on Blood Pressure, J. H. McCurdy, M.D., Int. Y. M. C. A. Training School, Springfield, Mass.

Influence upon Blood Corpuscle Count, Hemoglobin, Sphygmograph Tracing, etc., by Gymnastic Exercise (Swedish and Team Work), James A. Babbitt, M.D., Haverford College, Pa.

Psychological Aspects of Muscular Exercise, Luther Gulick, M.D., Pratt Institute, Brooklyn.

Principles of Education that Should be Included in the Training of a Specialist, Professor Nicholas Murray Butler, Columbia University.

Out-of-Door Gymnasiums, J. H. Kellogg, M.D., Battle Creek, Mich.

Evening Session, 8 P.M.—Columbia University Gymnasium.

Gymnastic Exhibition of Adult Work:

Turners, mass and heavy.

Turners, fencing.

Business Women's class Savage Gymnasium, Dumb-bells, bar-bells and bowling balls.

Normal Class Savage Gymnasium, Indian clubs.

Columbia College, mass, wrestling and pyramids.

Dancing Calisthenics, St. Bartholomew's Parish House.

Y. M. C. A., mass and game.

Saturday, April 20th—Hall of the Board of Education.

9 A.M.—Final Business Meeting.

Unfinished General Program (if any).

Selection of Place for next Convention.

Unfinished Business and Reports of Committees.

2 P.M.—Afternoon Session. Ninth Regiment Armory, West 14th Street.

Gymnastic Exhibition, Children's Classes.

I. Public Schools:

Primary, Bean bags, Queens; Free, Manhattan.

Grammar, Free, Manhattan; Free, Apparatus, Brooklyn.

Girls' High, Clubs and Heavy, Manhattan.

II. Private Schools and Other Classes.

Y. M. C. A. Juniors.

Private Schools.

Turners, tambourine drill.

St. Francis Xavier Cadets, military.

Evening—Savoy Hotel (?). Reception and Dinner.

NOTES.

A list of gymnasiums, schools, colleges, clinics, etc., which will be open for inspection on Wednesday, April 17th, may be obtained at the Convention Headquarters as early as April 16th.

Special arrangements have been made with the management of the Murray Hill Hotel, Park Avenue and 40th Street, for the accommodation of delegates to the Convention.

For information in regard to the above, apply to J. Blake Hillyer, Secretary, Convention Committee, 23 Tompkins Avenue, New Brighton, Staten Island, N. Y. (Enclose an addressed stamped envelope for reply.)

NOTICE—That the statistics of the Association may be complete and proper credit given to those who have been its members during the period from 1885 to 1896, it is important that all such members send to the Corresponding Secretary a postal card, stating the year in which they joined the Association. In the next catalogue of members the year of admission to the Association will be published with the name. If the proposed Constitution published in this number of the REVIEW is adopted, this data will be important in deciding precedence. It is earnestly hoped, therefore, that members will respond immediately so that the catalogue may be completed without delay. No admissions since January 1st, 1896, are necessary, inasmuch as the card catalogue of members contains the date of admission; previous to this date, however, no such catalogue was in existence.

PRELIMINARY REPORT OF THE COMMITTEE OF NINE.

This committee was called into being by the following resolutions offered by the New York delegation at the First National Convention at Boston, 1899:

"Whereas, We believe that the interests of Physical Education in this country require a high standard of excellence, with one and preferably two years of special preparation of the teacher, and that the influence of this Association should be exerted toward this end, therefore, be it

Resolved, That the American Association for the Advancement of Physical Education shall at this Convention appoint a Committee with membership sufficiently large and representative of the many scattered societies and various phases of the subject of Physical Education, which shall thoroughly investigate and report to the next Convention:

(1) A rational and efficient curriculum of studies necessary for one intending to teach Physical Education in schools, colleges, etc., in this country.

(2) The courses now offered at the various schools, colleges and other public and private institutions in the country, where normal training in Physical Education is given, with a view toward officially recommending such as prove to be adequate; and,

(3) Conduct such examinations, theoretical and practical, for such candidates as may desire it, on such subjects as the Committee may deem a part of the necessary equipment of the teacher of Physical Education, with the view of issuing a diploma of the American Association for the Advancement of Physical Education to such candidates as have passed satisfactorily."

Your committee has considered the first section of these resolutions and is prepared to make a preliminary report thereon.

The committee respectfully offers the following recommendations:

(1) That the admission requirement to normal schools of physical training shall be a high school education or its equivalent,

(2) That prospective candidates for admission shall be recommended to select especially such courses in preparation as physics, chemistry, mathematics and biology (botany and zoology).

(3) That average health and strength shall be required of prospective candidates for graduation,

(4) That previous training in gymnastics is desirable.

(5) That candidates for admission to normal schools of physical training be required to furnish satisfactory endorsements from at least two persons, as to moral character and general fitness, preferably from the last teacher and from the pastor or some responsible business acquaintance.

(6) That pupils shall not be admitted under eighteen years of age.

(7) That normal schools of gymnastics admit all pupils on probation.

(8) That a two years' course of study and training of at least thirty weeks' duration each year, shall be considered a minimum preparation for teaching physical training.

(9) That a three years' course should be considered desirable for teachers of physical training.

(10) That the minimum training for teachers of physical training should be extended to three years of thirty weeks each as soon as practicable.

The Committee recommends the following as a desirable curriculum for the theoretical work of normal schools for a two years' course of study and approximately the least number of hours each study should be pursued:

Physics, 30 hours.

Chemistry, 60 hours.

Anatomy, gross and microscopical, 90 hours.

Physiology, 90 hours.

Physiology of exercise, 90 hours.

Animal mechanics (general kinesiology), 45 hours.

Personal hygiene and emergencies (first aid) 45 hours.

Anthropometry, physical examination and diagnosis, prescription of exercises, 90 hours. (Theoretical part.)

History of physical training and theory of physical training (special kinesiology), 100 hours.

Pedagogy and psychology, 90 hours.

Voice training, 30 hours.

FOR A THIRD YEAR.

General massage, medical gymnastics and clinical applications of same, 180 hours.

Pathology, 45 hours.

Advanced physiology of exercise and experimental physiology, 100 hours.

School government, 12 hours.

The Committee further recommended:

(1) That 25 hours per week be devoted to the theory and the practice of gymnastics.

(2) That the theoretical work should occupy 12 hours per week.

The following list of gymnastic exercises, games, etc., is reported by the Committee for publication without recommendation:

III. PRACTICAL WORK.

I. Marching—Tactics; figure marching, maze running; fancy steps; dancing; running.

II. Light Gymnastics (Calisthenics)—Free exercises; wooden dumb-bells; iron dumb-bells; Indian clubs; wands and bar bells; rings, hoops, poles, balls, etc.

III. Heavy Gymnastics.—Parallel bars, suspended bars, horizontal bars, vaulting bars, Swedish boom, side horse, long horse, buck, flying rings, traveling rings, ladders, ropes, climbing poles, chest weights, stall bars, mat work, tumbling, pyramids—Roman ladders, see-saw (balance swing), balancing board, giant stride, bouncing board (spring board).

IV. Combative Exercises—Boxing, wrestling, fencing-foils, single stick, sabre (broad sword), French cane, bayonet, quarter staff, dueling sword.

V. Athletics—Track sports, walking, running, hurdling, bicycling, field sports, high jump, broad jump, pole vault, putting shot, throwing hammer, discus, javelin.

VI. Games—Indoor team games: Basket-ball, indoor baseball, battle-ball, pin-ball, volley-ball, potato race, other games. Indoor Gymnastic games.

Outdoor games: Foot-ball—Rugby, foot-ball—Association, base-ball, field hockey, lacrosse, cricket, golf, tennis, Minton, archery, cross country running.

VII. Aquatics—Rowing—fixed seat, rowing—sliding seat, paddling, swimming, diving, water polo, water base-ball.

VIII. Ice Sports—Skating, ice hockey, curling, skeeing, snowshoeing.

PROPOSED NEW CONSTITUTION OF THE A. A. A. P. E.

The following report embodying a new Constitution of the A. A. A. P. E., is hereby submitted by the Constitutional Commit-

tee of the National Council, for consideration by the members previous to the Convention to be held in New York, April 18th, 19th and 20th:—

NAME.

Article 1. This body shall be called the American Association for the Advancement of Physical Education.

OBJECTS.

Article 2. The objects of this Association shall be to awaken a wider and more intelligent interest in Physical Education; to acquire and disseminate knowledge concerning it; and to labor for the improvement and extension of gymnastics, games, and athletic pastimes in the education of children and youth.

MEMBERSHIP.

Article 3. The membership of the societies belonging to this Association shall consist of Members, Fellows, Patrons, Honorary Members and Honorary Fellows.

Article 4. Any person may become a member of the Association upon recommendation by two members or Fellows, and election by the Council.

Article 5. Any person who has been a member of the Association for at least three years and who has been actively engaged in teaching physical training either in theory or practice for five years, or who has been engaged in writing, lecturing, collecting statistics, making original investigations, inventing new games, exercises, and apparatus, or doing any kind of notable work that has tended to the advancement of physical education, may be elected a Fellow of the Association.

The election of Fellows shall be by ballot and a majority vote of the members of the Council at a designated meeting of the Council.

Article 6. Any person paying to the Association the sum of $500. shall be classed as a Patron, and shall be entitled to all the privileges of a member and to all publications of the Association.

Article 7. Honorary members shall not exceed the proportion of one to twenty-five members, and shall consist of persons well known as advocates and supporters of physical education. They shall be nominated by the Council and require a two-thirds vote of the members present to elect.

Article 8. Honorary Fellows of the Association, not exceeding two for each section, may be elected; the nominations to be made by the Council and approved by ballot in the respective sections before election by ballot in General Session. Honorary Fellows shall be entitled to all the privileges of Fellows and shall be exempt from all fees and assessments, and entitled to all publications of the Association issued after the the date of their election.

Article 9. The name of any member or Fellow two years in arrears for annual dues shall be erased from the list of the Association, provided that two notices of indebtedness, at an interval of at least three months, shall have been given; and no such person shall be restored until he has paid his arrearages or has been re-elected.

Article 10. No member or Fellow shall hold office in more than one section at any one meeting.

OFFICERS.

Article 11. The officers of the Association shall consist of a President, a Vice-President from each Section, a permanent Secretary, a general Secretary, a Secretary of the Council, a Treasurer, and a Secretary of each Section. These officers, with the exception of the permanent Secretary and the Treasurer, shall be elected at each meeting for the following one and, with the exception of the Treasurer and the permanent Secretary, shall not be re-eligible for the next two meetings. The term of office of the permanent Secretary and of the Treasurer shall be five years.

Article 12. The President, or, in his absence, the senior Vice-President present, shall preside at all General Sessions of the Association and at all meetings of the Council. It shall also be the duty of the President to give an address at a General Session of the Association at the meeting following that over which he presided.

Article 13. The Vice-Presidents shall be chairmen of their respective Sections, and of their Sectional Committees, and it shall be part of their duty to give an address, each before his own Section, at such time as the Council shall determine at the meeting subsequent to that at which he presides. The Vice-Presidents may appoint temporary chairmen to preside over the Sessions of their Sections, but shall not delegate their other duties. The Vice-Presidents shall have seniority in the order of their continuous membership in the Association.

Article 14. The General Secretary shall be the Secretary of all General Sessions of the Associations, and shall keep a record of the business of these Sessions. He shall receive the records from the Secretaries of the Sections, which, after examination, he shall transmit with his own records to the permanent Secretary within two weeks after the adjournment of the meeting.

Article 15. The Secretary of the Council shall keep the records of the Council. He shall give to the Secretary of each Section the titles of papers assigned to it by the Council. He shall receive proposals for membership and bring them before the Council.

Article 16. The Permanent Secretary shall be the executive officer of the Association under the direction of the Council. He shall attend to all business not specially referred to committees nor otherwise constitutionally provided for. He shall keep an account of all business that he has transacted for the Association, and make annually a general report for publication in the AMERICAN PHYSICAL EDUCATION REVIEW.

He shall attend to the printing and distribution of the Proceedings of the annual and other meetings, together with the publication of the AMERICAN PHYSICAL EDUCATION REVIEW and all other printing ordered by the Association.

He shall issue a circular of information to members and Fellows at least two months before each meeting, and shall, in connection with the Local Committee, make all necessary arrangements for the meetings of the Association.

He shall provide the Secretaries of the Association with such books and stationery as may be required for their records and business. He shall collect all assessments and admission fees, and notify members and Fellows of their election, and of any arrearages.

He shall receive, and bring before the Council, the titles and abstracts of papers proposed to be read before the Association.

He shall keep an account of all receipts and expenditures of the Association, and report the same annually at the first meeting of the Council, and shall pay over to the Treasurer such unexpended funds as the Council may direct.

He shall receive and hold in trust for the Association all books, pamphlets and manuscripts belonging to the Association, and allow the use of the same under the provisions of the Constitution and the orders of the Council. He shall receive all communica-

tions addressed to the Association during the intervals between meetings and properly attend to the same.

He shall be allowed a salary which shall be determined by the Council, and may employ one or more clerks at such compensation as may be agreed upon by the Council.

Article 17. The Treasurer shall invest the funds received by him in such securities as may be directed by the Council. He shall annually present to the Council an account of the funds in his charge.

No expenditure of the principal in the hands of the Treasurer shall be made without a unanimous vote of the Council, and no expenditure of the income received by the Treasurer shall be made without a two-thirds vote of the Council. The Treasurer shall give bonds for the faithful performance of his duty in such manner and sum as the Council shall from time to time direct.

Article 18. The Secretaries of the Sections shall keep the records of their respective Sections, and, at the close of the meeting, give the same, including the records of sub-sections, to the General Secretary. They shall also be the Secretaries of the Sectional Committees. The Secretaries shall have seniority in order of their continuous membership in the Association.

Article 19. In case of a vacancy in the office of President, the Senior Vice-President shall preside, as provided in Article 12, until the General Committee can be assembled and the vacancy filled by election. Vacancies in the offices of Vice-Presidents, Permanent Secretary, Secretary of the Council, Secretaries of the Sections, and Treasurer, shall be filled by the Council by ballot.

Article 20. The Council shall consist of the past Presidents, and Vice-Presidents of the last two meetings, together with the President, the Vice-Presidents, the Permanent Secretary, the General Secretary, the Secretary of the Council, the Secretaries of the Sections, and the Treasurer of the current meeting, with the addition of one Fellow elected from each Section by ballot on the first day of its meeting. The members present at any regular meeting of the Council, provided there are at least five, shall form a quorum for the transaction of business. The Council shall meet on the day preceding each annual meeting of the Association, and arrange the program for the first day of the Sessions. The time and place of this meeting shall be designated by the Permanent Secretary. Unless otherwise agreed upon, regular meetings of the Council shall be held in the Council room at 9 o'clock A.M., on each day of the meeting of the Association. Special

meetings of the Council may be called at any time by the President, or at the request of five members of the Council. The Council shall be the board of supervision of the Association, and no business shall be transacted by the Association, that has not first been referred to, or originated with, the Council.

The Council shall decide which papers, discussions, and other proceedings shall be published, and have the general direction of the publications of the Association; arrange the business and programs for General Sessions; suggest subjects for discussion, investigation or reports and elect members and Fellows. The Council shall receive all reports of Special Committees and decide upon them, and only such shall be read in General Session as the Council shall direct.

The Council shall appoint at each meeting the following subcommittees, who shall act, subject to appeal to the whole Council, until their successors are appointed at the following meeting: I, on Papers and Reports; II, on Members; III, on Fellows.

Article 21. The General Committee shall consist of the Council and one member or Fellow elected by each of the Sections, who shall serve until their successors are elected. It shall be the duty of the committee to meet at the call of the President and elect the general officers for the following meeting of the Association. It shall also be the duty of this committee to fix the time and place of the next meeting.

The Vice-President and Secretary of each Section shall be nominated to the General Committee by the Sectional Committee.

MEETINGS.

Article 22. The Association shall hold a public meeting annually for three days, or longer, at such time and place as may be determined by vote of the General Committee, and the preliminary arrangements for each meeting shall be made by the Local Committee, in conjunction with the Permanent Secretary and such other persons as the Council may designate.

Article 23. A General Session shall be held at 10 o'clock A M. on the first day of the meeting, and at such other times as the Council may direct.

SECTIONS AND SUB-SECTIONS.

Article 24. The Association shall be divided into six Sections, namely:

A. Colleges and Secondary Schools.
B. Normal Schools.
C. Elementary Schools.
D. Anthropometry.
E. Medical Gymnastics.
F. Playgrounds and Out-of-door Gymnasiums.

The Council shall have power to organize new Sections, or to consolidate any two or more Sections temporarily, and such consolidated Sections shall be presided over by the Senior Vice-President and Secretary of the Sections comprising it.

SECTIONAL COMMITTEES.

Aticle 25. Immediately on the organization of a Section there shall be three members or Fellows elected by ballot after open nomination, who, with the Vice-President and Secretary and the Vice-President and Secretary of the preceding meeting, shall form its Sectional Committee.

The Sectional Committee shall have power to fill vacancies in their own number.

Meetings of the Sections shall not be held at the same time with a General Session.

SUB-SECTIONS.

Article 26. The Sectional Committee of any Section may at its pleasure form one or more temporary Sub-sections, and may designate the officers thereof.

The Secretary of a Sub-section shall, at the close of the meeting, transmit his records to the Secretary of the Section.

PAPERS.

Article 27. No paper shall be read in any Section or Sub-section until it has been placed on the program of the day by the Sectional Committee.

DUTIES OF SECTION COMMITTEE.

Article 28. The Sectional Committee shall arrange and direct the business of their respective Sections. They shall prepare the daily programs and give them to the Permanent Secretary for printing at the earliest moment practicable. No titles of papers shall be entered on the daily programs except such as have passed

the Committee. No change shall be made in the program for the day in a Section without the consent of the Sectional Committee.

The Sectional Committee may refuse to place the title of any paper on the program; but every such title, with the abstract of the paper, or the paper itself, must be referred to the Council with the reasons for its rejection.

Article 29. The Sectional Committee shall also make nominations to the General Committee for Vice-President and Secretary of their respective Sections as provided in Article 21.

Article 30. The Sectional Committee shall examine all papers and abstracts referred to the Sections, and they shall not place on the program any paper inconsistent with the character of the Association; and to this end they have power to call for any paper, the character of which may not be sufficiently understood from the abstract submitted.

PAPERS AND COMMUNICATIONS.

Article 31. All members and Fellows must forward to the Secretary of the proper Section, or to the Permanent Secretary, as early as possible, and when practicable before the convening of the Association, full titles of all the papers which they propose to present during the meeting, with a statement of the time that each will occupy in delivery, and also such abstracts of their contents as will give a general idea of their nature; and no title shall be considered by a Sectional Committee until an abstract of the paper or the paper itself has been received.

Article 32. If the author of any paper be not ready when called upon in the regular order of the official program, the title may be dropped to the bottom of the list.

Article 33. Whenever practicable, the proceedings and discussions at General Sessions, Sections and Sub-sections shall be reported by professional reporters, but such reports shall not appear in print as the official reports of the Association, unless revised by the Secretaries.

PRINTED PROCEEDINGS.

Article 34. The Permanent Secretary shall have the proceedings of each meeting printed in the AMERICAN PHYSICAL EDUCATION REVIEW as soon after the meeting as possible.

Authors must prepare their papers or abstracts ready for the

press, and these must be in the hands of the Secretaries of the Sections before the final adjournment of the meeting, otherwise only the titles will appear in the report of the proceedings. The Council shall have power to order the printing of any paper by abstract or by title only.

Whenever practicable, proofs shall be forwarded to authors for revision.

If any additions or substantial alterations are made by the author of a paper after its submission to the Secretary, the same shall be distinctly indicated.

Where illustrations are used they must be provided for by the author of the paper, or by special appropriation from the Council. Four numbers each year of the AMERICAN PHYSICAL EDUCATION REVIEW shall be forwarded to every member and Fellow of the Association who shall have paid his annual dues as per Article 38.

The Permanent Secretary shall also offer the AMERICAN PHYSICAL EDUCATION REVIEW for sale at such prices as the Council may determine.

The Council shall also designate the institutions to which free copies shall be distributed.

LOCAL COMMITTEE.

Article 35. The Local Committee shall consist of persons interested in the objects of the Association and residing at or near the place of the proposed meeting. It is expected that the Local Committee, assisted by the officers of the Association, will make all essential arrangements for the meeting, and issue a circular giving necessary particulars, at least one month before the meeting.

LIBRARY OF THE ASSOCIATION.

Article 36. All books and pamphlets received by the Association shall be in charge of the Permanent Secretary, who shall have a list of the same printed and shall furnish a copy to any member or Fellow on application. Members and Fellows who have paid their assessments in full shall be allowed to call for books and pamphlets, which shall be delivered to them at their expense, on their giving a receipt agreeing to make good any loss or damage, and to return the same free of expense to the Secretary at the time specified in the receipt given. Not more than three books, in-

cluding volumes, parts of volumes and pamphlets, shall be held at one time by any member or Fellow. Anl book may be withheld from circulation by order of the Council. (Library of the Association to be deposited at some City or University Library.)

ADMISSION FEE AND ASSESSMENT.

Article 37. The admission fee for members shall be one dollar in addition to the annual assessment. On the election of any member as a Fellow an additional fee of three dollars shall be paid.

Article 38. The annual assessment for members and Fellows not members of local societies shall be two (2) dollars. For members of local societies, of at least 25 members, the annual assessment shall be one (1) dollar.

Article 39. All fees and assessments must be paid to the Permanent Secretary, who shall give proper receipts for the same.

ACCOUNTS.

Article 40. The accounts of the Permanent Secretary and of the Treasurer shall be audited annually, by auditors appointed by the Council.

LOCAL SOCIETIES.

Article 41. Local Societies shall be considered Branches of the National Society in which the Local Sections bear the same relation to the Local Society in organization, that the National Sections bear to the National Society.

Article 42. As prerequisite to membership in any Section or local society, the applicant must become a member of the American Association for the Advancement of Physical Education in good and regular standing.

Article 43. The Council of each local society shall be at liberty to levy assessments upon its members to meet local expenses, and to pass or amend special by-laws at its own discretion for the regulation of its particular affairs, so long as they do not conflict with the constitution and general by-laws above set forth.

ALTERATIONS OF THE CONSTITUTION.

Article 44. No part of this constitution shall be amended or annulled, without the concurrence of three-fourths of the mem-

bers and Fellows present in General Sessions, after notice given at a General Session of a preceding meeting of the Association.

LIFE MEMBERSHIP.

Any member or Fellow who shall pay the sum of (fifty?) thirty dollars to the Association at any one time, shall become a life member, and as such, shall be exempt from all further assessments, and shall be entitled to the Proceedings of the Association.

All money thus received shall be invested as a permanent fund, the income of which, during the life of the member, shall form a part of the general fund of the Association; but after his death, shall be used only to assist in original research, unless otherwise directed by unanimous vote of the Council.

For the Committee,

D. A. SARGENT, M.D., Chairman.

CORRESPONDENCE.

To Instructors in Physical Training:

I must ask the assistance of those in charge of the Department ot Physical Training in Schools, especially High and Normal Schools, for the purpose of securing statistical data as to the functional condition of the young women* under their charge under varying mental and physical conditions. I desire these facts in the interest of the National Committee for the purpose of determining the advantages and the limitations of physical education and athletic sports as a safeguard against and prevention of the functional irregularities which are altogether too common among our school girls. As results obtained by a consideration of sufficient numbers alone can be convincing, I earnestly request those who are sufficiently interested to give the facts desired with reference to their pupils, to communicate with,

Geo. J. Engelmann, M.D.,
Member National Committee, A. A. A. P. E.

208 Beacon Street, Boston, March 4, 1901.

* See article in this Review on "The American Girl of Today."

EDITORIAL NOTE AND COMMENT.

The Proposed Constitution of the A. A. A. P. E.—The constitutional history of the A. A. A. P. E. promises to be as varied and intricate as that of many countries. The Constitution which is proposed by our President, published elsewhere in this number of the Review will, however, serve to remove many embarrassing conditions which now exist and will doubtless have the effect of stimulating the Association to renewed development. The present constitution was based upon that of the Turner Association which, though effective for a large organization, has not proved to be adapted to our smaller one. The new Constitution is based on that of the American Association for the Advancement of Science, which has been in successful existence for fifty years. The conditions in the two associations are essentially similar, and it is probably safe for us to adopt this Constitution at the coming meeting, if it is so voted. The provisions for the government of the Association make possible exceptionally good representation of all sections of the country, and although its scattered nature will undoubtedly necessitate considerable correspondence to obtain the Council votes, it may nevertheless enable this body to be more closely in touch with the main body of the Association than is now possible.

The provision for life members seems especially attractive as providing both for an established income and a permanent fund for purposes of investigation. Mushroom growth of new societies is not stimulated by the new Constitution, but full recognition is given to those already established and a more stable basis is afforded those which may be started under it.

The establishment of Fellows is in accord with the proposition that was offered at the last Convention, to certify members who had successfully taught, or had had a specially broad preparation for the work; and this feature deserves the cordial support of all the older members of the Association, who, by becoming Fellows, may thus establish the distinction upon a secure footing.

The physical condition of woman has always been one of the most serious problems which physical trainers have been forced

to face, for the reason that women are most in need of training and at the same time it is most difficult to provide them with it in safe, attractive and adequate form. The work that Dr. Engelmann has done, the fruits of which he presents in this number of the REVIEW, furnishes the most authoritative foundation for attacking the problem which we possess, but as Dr. Engelmann states, the essential problem is still to be solved and to this end he appeals for data. It is impossible for any one person to collect the necessary statistics from his own experience; therefore, cooperation on the part of those who have opportunity to study these conditions is essential. Dr. Engelmann is peculiarly fitted by his large experience and strong interest in the subject to make the final study of these observations and we therefore earnestly urge all who have observations to send them to him. Of course the desire of those who have been laboriously collecting statistics to obtain, through publication, credit for their work is natural, and yet we cannot doubt that this desire will be generously sacrificed that the larger and more valuable results from their work may be attained.

BOOK NOTICES AND BIBLIOGRAPHY.

MIND AND BODY, MILWAUKEE, WIS.:

November, 1900: Gymnastic Nomenclature, E. H. Arnold; To the Executive Committee of the North American Gymnastic Union; Extracts from European Journals on Physical Training, Carl L. Schrader; America gets the Olympian Games for 1901; Indian Club Exercises, Karl F. Ross; Anti-Foot Ball Legislation; Rules for Games, Jessie H. Bancroft; Hand-Ball.

December: Gymnastic Nomenclature, E. H. Arnold; Report to the N. A. G. U. on the Phil. Festival; To the Executive Committee of the N. A. G. U. (Edward M. Hartwell, M.D.); To the Executive Committee of the N. A. G. U. (Dr. F. Pfister); Calisthenics for "Juniors and Men," R. Meller; The Criticues of the Philadelphia National Festival; Purpose of Dietetics, translated by Carl L. Schrader; Hygiene of Public Schools, C. F. Ulrich; Exercises for Ladies on the Side-Horse, arranged by E. A. Heers; Wrestling, J. P. Kimmell; The Game of War, Miss A. R. Reynold.

January, 1901: Fire Horrors, Henry Suder; Physical Training, Karl J. Kroh, Caroline Crawford; Abstracts, Exertion, translated by Carl L. Schrader; Questions in the Science of Education for License to teach Physical Training in New York City High Schools, May, 1900; The Element of Pleasure in Physical Education; The Inomotor, D. A. Sargent; The Influence of Exercise on Growth.

February: A Home Course in Physical Training, Max E. Peltzer; The Inomotor, D. A. Sargent; Correspondence; Swedish Physiology; Physical Culture; Expert Testimony on the Value of Foot-ball; Home Gymnastics; Flag-Roundel for 16 Girls, Carl Ross; A Few Simple Athletic Tricks, William C. Schæfer; The Game of "Squash"; Jahn's Physical Training Club of Chicago; Cricket in and about Philadelphia, A. A. Weaver; Feeble Children cured by Gymnastics; A New Rowing Tank.

CHILD-STUDY MONTHLY, CHICAGO, ILL.:

November, 1900: Child-Study Congress, May, 1900, D. P. MacMillan; Adaptation of Bible Literature to the Child, Ernest D. Burton; Family Status and Secondary Education, Henry W.

Thurston; The Cultivation of the Sense of Beauty, Lucy S. Silke; Child-Study in the Home, Martha V. McLeish; Pedagogical Method in the Sunday School, Jenkin Lloyd Jones.

December: Education as a Factor in Pathogenesis, Francis W. Parker; Medical Inspection in Chicago Schools, Arthur R. Reynolds; Why We Study the Physical Nature of the Child, Fred W. Smedley; Physical Training in Public Schools, Lura W. Sanborn; Testing the Eyes and Ears of School Children, Frank Allport; Standing on One Foot; Muscular Tone and Inner Mood; Testing Hearing with the Audiometer, C. Victor Campbell.

January, 1901: The Vocabulary of a Two-Year-Old Child, John I. Jegi; Testing the Eyes and Ears of School Children, Frank Allport; Testing the Eyesight of Those Who Cannot Read, C. Victor Campbell; Two Recent Studies of Children's Vocabularies, Editor.

February: Meeting of the Springfield Branch of the Illinois Society for Child-Study; Sight Tests of Chicago School Children, Charles C. Krauskopf; Sight and Hearing in Education, Frank H. Hall; Discussion of Papers; Notes by the Secretary; Fatigue in Relation to Consciousness; What Child-Study Has Brought the Children, Francis W. Parker.

THE DIETETIC AND HYGIENIC GAZETTE, NEW YORK, N. Y.:

December, 1900: Physical Exercises in the Treatment of Pulmonary Tuberculosis, Parker Murphy, M.D.; The Importance of Oxygen in Vital Phenomena; Danger in Dust; Constitutionality of Pure Food Laws; The Relation of Agriculture to the Public Health; Sunlight and the Home; Stature and Intelligence.

January, 1901: The Essentials of Health and Longevity, W. G. Kemper, M.D.; The Physical Basis of Mind, Brooks F. Beebe, M.D.; The Advantage of a Mixed Diet; Physical Training the Fundamental Part of Universal Education; Athletics and Practical Physiology in Medical Schools; Massage in Japan; Mouth-Breathing and Its Relation to Diseases of the Throat, Nose and Accessory Cavities; The Human Eye, and How to Care for it; The Fire That Kindles Power.

February: The Therapeutical Drinking of Hot Water—Its Use and Origin, Ephriam Cutter, M.D.; How Normal Body Temperature is Maintained in Cold Weather; Health, a Birthright and How to Maintain it; Diets for Everyday use, J. Warren Achorn, M.D.; The Availability of the Different Classes of Nutrients in Food of Mixed Diet; Value of Meat in the Prevention and Treat-

ment of Pulmonary Tuberculosis; The Effect of Cold upon the Mind; Parthenogenerated Man; The Preservation of the Teeth of School Children; Physical Culture.

EDUCATIONAL REVIEW, NEW YORK, N. Y.:

December, 1900: Wanted—A Teacher, James H. Canfield; Limitations of the Power of the College President, L. Clark Seelye; School Reminiscences (1), J. M. Greenwood; Failures in the first year of the High School, Ray Greene Huling; Government of Women Students in Colleges and Universities, Louise S. B. Saunders; The International Jury on Elementary Education at the Paris Exposition, Anna Tolman Smith; A Modern Wandering Scholar (with portrait), Thomas Davidson.

January, 1901: Should the Higher Education of Women Differ from that of Men? M. Carey Thomas; Suggestions for Teachers of American literature, Brander Matthews; Educational Resources of the Community, Samuel T. Dutton; The Organization of Geography, Charles R. Dryer; Elective Studies in High Schools, John Tetlow; A Juror's Experience at the Paris Exposition, Henry L. Taylor; Defects in Elementary Text-books, James H. Blodgett.

February: Education for Government Scientific Work, Henry S. Pritchett; School Reform: A Reply to Professor Münsterberg, Charles De Garmo; The Central Defect of the Normal School, William H. Mace; Preparation for College and Preparation for Life, Paul H. Hanus; Lesson Plans: An Experiment, Colin A. Scott; The German Gymnasium from a Pupil's Standpoint, Ernest Bruncken; Educational Lessons of the School Exhibits at Paris, Anna Tolman Smith; B. A. Hinsdale (with portrait).

THE PEDAGOGICAL SEMINARY, WORCESTER, MASS.:

December, 1900: A Study in the Play Life of Some South Carolina Children, Zach McGhee; L'Ecole des Roches, A School of the Twentieth Century, T. R. Croswell; A Study of the Teacher's Influence, Sanford Bell; Bibliography of Child Study for 1899, Louis N. Wilson; Current European Educational Thought, Alexander F. Chamberlain.

POSSE GYMNASIUM JOURNAL, BOSTON, MASS.:

November, 1900: Experimental Study of Children; Gymnastics in Toledo Public Schools (concluded); The Physical Basis of

General Qualities of Mind and Soul (continued), Baron Nils Posse; The Peril of Being Healthy, Anna McKenzie; The Reflex Influence of the Teacher's Calling; Basket-ball without a Basket; Dribble-ball; Rheumatism and the Heart.

December: The Physical Basis of General Qualities of Mind and Soul (continued), Baron Nils Posse; The Physician's Influence in Re-Vacation Schools, Helen C. Putnam, M.D.; Extract from "Adolescence," E. Kate Carman; National Education Association; Extracts from Stockholm's "Afton blad"; Removing Obstructions from the Nose.

January, 1901: A Practical Talk to Mothers and Teachers, by Dr. E. M. Mosher; The Posse Gymnasium Summer School; The Physician's Influence in Re-Vacation Schools, Helen C. Putnam, M.D.; Diets for Every-Day Use, J. Warren Achorn, M.D.; Value of Sleep.

February: Physical Education, M. Stansfeld; Diet in Dyspepsia, J. Warren Achorn, M.D.; School Gymnastics with Light Apparatus, by Jessie H. Bancroft (Book Review); Johnson's Physical Culture (Book Review); Fencing Competition; Posse Wins at Fencing; Acidity of the Mouth During Sleep.

THE ELEMENTARY SCHOOL RECORD, UNIVERSITY OF CHICAGO, CHICAGO, ILL.:

No. 9. Curriculum: Notice to Subscribers; The Psychology of the Elementary Curriculum, Dr. John Dewey; School Reports, etc.

EDUCATION, BOSTON, MASS.:

January, 1901: General Domingo Faustino Sarmiento, Henry H. Barroll; The Sphere and Study of Art, Franklin B. Sawyer; Mark Twain as an Educator, Clemens J. France; Progress and Providence (concluded), John Ogden; School Examinations, Mary H. Leonard; The Problems Facing the Normal School at the Opening of the Twentieth Century, Homer H. Seerley; How the Home May Help the School, Frank H. Palmer; Hindrance to Efficient Service, Ernest D. Daniels; Outline Study of Scott's Ivanhoe, Maud E. Kingsley; Notes on Exhibits at Paris, A. T. S.

THE GYMNASIUM, LONDON, ENGLAND:

December, 1900: The British College of Physical Education; A Set of Easy Bar-bell Exercises, arranged by W. M. Vardon;

Penarth Gymnasium; Gymnasium News; In Prussia; Physical Exercise for the Army; Golf; Diet; Coming Events; Result of Guinea Prize Competition.

January, 1901: Loreto Physical Education Society; Physical Training for Dunfermline Teachers; Physical Training; Coming Events; Gymnastic Firemen in France; Physical Exercise: Its Use and Abuse; National Society of Physical Education; Girls' Schools Gymnastic Contest; N. P. R. S. Physical Tests; Musical Drill Contest; Competitive Gymnastics in Kent; Gymnastic Literature; Gymnastic News.

February: Monthly Review; Gymnastics; Representative Gymnastic Teachers; Result of Prize Competition; Modern Gymnastic Training; Harpenden Gymnasium; Sandow's System of Physical Culture; Rambles Round Dublin; Diet; In Prussia; Gymnasium News; Coming Events; The Corset; The Ling Association.

REVUE INTERNATIONALE DE PÉDAGOGIE COMPARATIVE, NANTES, FRANCE.

November and December, 1900: Notes upon the Exposition; The International Congress of Deaf-Mutes, and the Resolutions passed by the Congress; The International Congress for the Amelioration of the Condition of the Blind; The International Congress of Hypnotism; The International Congress of Physical Education; The French Educational League; The International Congress of the Public Assistance and Private Philanthropy; A Study Upon Play; Book Reviews, etc.

DEUTSCHE TURN-ZEITUNG,LEIPSIC, GERMANY, 1900. VOL. LV.:

No. 47 (November 22nd). Gymnastic Teachers on Higher Schools; reply to an article which appeared in a paper of Munich on the subject of employment as teachers of Gymnastics of pensioned army officers, by Dr. Ernest Lange. New School Gymnasia at Leipzig with illustrations by Bernhard Striegler; Walking, Running and Jumping, by Theodor Wohlrath.

No. 48 (November 29th). Appeal for the collection of a Fund for a Monument in honor of Guts-Muths, by M. Zettler; A Medical Opinion of German Gymnastics, by W. Auerbach, concluded in No. 49; Karl Rothermel, with cut by Ernst Hess; Roundel with song (Liederseigen), by Fr. Fischer; Groups of Exercises for Horizontal and Parallel Bars, by Daniel Kappel.

No. 49 (December 6th). The year 1899 in the life of the German Turnerschaft, by Dr. Rud. Gasch, continued in Nos. 50, 51 and 52: A Swiss Volksfest (Popular Festival), by Fr. Becker; Skating of the Turners, Bormann; Meeting at Madgeburg of the "Vorturner-Vereinigung" of 1877 with Groups of Exercises performed (concluded in No. 50).

No. 50 (December 13th). Life Memories, by Carl Euler; A Spring Excursion to the Black Forest of the Men's Division of the Berliner Turnerschaft (continued in Nos. 51 and 52), by Georg. Reimann; Jahn Letters: 12 Letters, by Fr. L. Jahn, to Ernst Eiselen, and 1 Letter to Lübeck, by Böttcher (continued in Nos. 51 and 52).

No. 51 (December 20th). The European Gymnastic Federation, by Johs. Temming; Class Leader's gathering at Leipzig and groups of free Exercises, and Exercises on the Apparatus, by Rud. Witzgall; Materials for the History of German Gymnastics, by M. Zettler.

No. 52 (December 27). Groups of Wand Exercises, by Gustav. Metzke (index of contents of Vol. 45).

1901. Vol. XLVI. No. 1 (January 3rd). A Greeting to the New Century by the President of the German Turnerschaft, Ferd. Goetz; What part have our nerves in Gymnastic Exercise? by Professor Partsch; Herman Schmidt (with portrait), A Turner for 50 years, by Alfred Burkardt; Indian Club-Reigen with Groupings, by Emma Baumann.

No. 2 (January 10th). Life Memories, by Carl Euler; Swiss Wrestling (illustrated), by Aug. Frei (concluded in No. 3); The Exercises at the 9th German Turnfest at Hamburg (continued); Hermann the Cherusk, by Gottfried Nickl (concluded in No. 3).

No. 3 (January 17th). Life Memories, by Carl Euler; The Exercises at the 9th German Turnfest at Hamburg (continued); Class Leader's Gathering and Exercises at Hanover, by Wilh. Scydel.

No. 4 (January 24th). About Physical Education in Japan, by Dr. Burgass; Calisthenics-Roundel with Groupings, by Hermann Schulz (concluded in No. 5); To the History of Gymnastics at Münster i W.

No. 5 (January 31st). The German Turnerschaft Financial Report for the year 1900. German or Swedish? by Dr. Küppers.

No. 6 (February 7th). About Physical Education in Japan, by Dr. Burgass (concluded); Groups of Exercises: free and apparatus, by W. Laus; Weapons and their use in their evidence of the state of civilization of the people, Dr. B.

No. 7 (February 14th). The Joy of Wandering, by Dr. Nawroth; Life Memories, by Carl Euler; Groups of Exercises for two Horizontal Bars in front of each other, by H. Munier; A Gymnastic hour for Girls, by Bernhard Striegler.

C. E.

A Plea for the Education of the Body, by Clyde E. Ehinger, M.D., West Chester, Pa. Presented to the Educational Conference, at Friends' General Conference, Chautauqua, N. Y., August 21-28, 1900.

PUBLICATIONS RECEIVED.

Education, Boston, Mass., January, 1901.

The Dietetic and Hygienic Gazette, New York, N. Y., December, January and February.

Brooklyn Medical Journal, Brooklyn, N. Y., December, January and February.

Report on Child-Study Investigation, by W. S. Christopher, M.D. Reprinted from the Annual Report of the Board of Education of Chicago, 1898-'99.

Preventive Work. Savings and Loans. The Home. (Health and Tenement-House Legislation.) By Joseph Lee. The Charities Review, New York, N. Y., December.

Health Culture, New York, N. Y., December, January and February.

Course of Study, Chicago Institute, Chicago, Ill. December, and January.

Good Housekeeping, Springfield, Mass., December.

Educational Review, New York, N. Y., December, January and February.

Pedagogical Seminary, Worcester, Mass., October and December.

The Gymnasium, Strand, London, England. January, April, June, August, September, October and November and February.

Posse Gymnasium Journal, Boston, Mass., November, December, and January and February.

School Weekly, Chicago, Ill.

School Journal, New York, N. Y.

Mind and Body, November, December and January.

Amerikanische Turnzeitung, Milwaukee, Wis.

Le Stand, Paris, France.

The Journal of Adolescence, Oak Park, Chicago, Ill., December.

The Elementary School Record, No. 9 Curriculum. Chicago University, Ill.

The Teachers' Institute, January. New York, N. Y.

Monthly Bulletin of the Statistics Dept. of the City of Boston, Mass., October.

Ny Tidning för Idrott, Stockholm, Sweden.

The American Girl of Today, G. J. Engelmann, M.D., Boston, Mass. Reprint.

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Annual Report of the Massachusetts Civic League, 1901. Boston, Mass.

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VOL. VI. NO. 2

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JUNE, 1901.

PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF PHYSICAL EDUCATION:

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Vol. VI. JUNE, 1901. No. 2

PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF PHYSICAL EDUCATION.

Held at Assembly Hall, Department of Education, New York City, April 18, 1901.

The Convention was called to order by the President, Dr. Dudley A. Sargent, who announced that the first business in order would be the address of welcome, and introduced the Hon. Miles M. O'Brien, President of the Board of Education of the City of New York, who spoke as follows:

MR. CHAIRMAN, LADIES AND GENTLEMEN:

On behalf of the Board of Education, the superintendents and teachers, I tender you a most hearty welcome, and I hope that you will not measure my welcome by the breadth of my remarks. When I find myself in an assemblage of this kind I always feel that I waste a good deal of valuable time by talking. On looking over your program, so diversified in usefulness, I find that if I refrain from this work there will be no harm done, because

NOTE.—The delay in the appearance of this report is due,
1. To the removal of the publication office from Boston to New York, change of editors, etc.
2. To the fact that the convention was held just before the long vacation.
3. To the serious illness of the reporter of the convention. Many papers in his possession had to be secured afresh at great difficulty and much delay.

The remaining portion of the report will follow this number quickly. Book reviews, news, reports of Societies, etc., will be resumed as soon as the convention report itself is published.—EDITOR.

there is nothing that I can say to you. I can assure you on behalf of the members of my Board that we are in full sympathy with you. It goes without saying that to have a healthy, vigorous mind you have got to have a healthy, vigorous body. This system of physical culture has come to stay. You are carrying it on, and will continue to carry it on, on intelligent lines. In some of our old schools, of course, we have not all the appliances that we ought to have, but I can assure you that in all the new schools of the future we will have a thorough equipment, and I hope that not the least important portion of our staff of teachers will be employed in this great work.

To you who do not live in New York, and who know very little about the conditions existing here, I am sure it would be of interest to know that we have in this city a greater school population than the whole population of any county in the State; that we have a greater school population—registered school population in the public schools—than any population in eighteen states of this Union. Our staff of teachers consists of over eleven thousand people. The conditions existing here differ from those of any other city in the world, because of the cosmopolitan character of our population and the fact that we are educating from un-American homes in many of the localities of our city. The only Americanism that comes to many of our children comes from the schools. You will be astonished if I point out to you the fact that I can take you to one of our schools, and in that school you will find twenty-nine distinct nationalities, and out of that number you can select all the children, or a portion of them, who will sing to you every patriotic American song that has been printed.

We believe that this portion of the educational work which you are interested in is not the least important. We believe that besides the splendid physical conditions that it brings around our young men and young women it is discipline, and that the mental process of education should go hand in hand with the physical process of education. This great city of ours, with its vast multitudes of different nationalities and its conditions, has been in the past and will be in the future progressive in everything for the better elevation of our little ones—mentally and physically—and in every way.

I am delighted, sir, to have you here, and I will again say to you that I will work with you most heartily. I have made arrangements with Superintendent Jasper to place at your disposal and at the disposal of your associates full liberty to visit our schools—to give you the freedom of our schools—and I assure you, ladies and gentlemen, that you are welcome to the use of this hall, from where you sit now to the desk of the Presi-

dent of the Board of Education. At any time that you come here you will meet with a most hearty welcome. I hope that the good work that you are engaged in will grow apace, and there is no board of education in this great land of ours that will be more thoroughly in sympathy and in more perfect accord, and in every way inclined to aid and assist not only our own teachers who follow this work, but you, sir, and yours, from Maine to California. We have the good fortune of having one of your teachers at the head of this department—a most efficient, patriotic and intelligent worker, Dr. Requa. I know the work she has done; I know her personality; I know that she carries more into that work than mere personal considerations, and I need hardly say to you that in any kind of work, especially educational, the heart has got to go with the head to produce the best results.

I thank you for your consideration. The obligation to avail myself of the opportunity of addressing you is mine; the pleasure mine also.

The Chair—I feel quite sure that all of the members of the Association will join me in thanking the school officials and others for the generous hospitality with which we have been received, and also the President of the Board of Education for the kind words of welcome which he has just spoken to us.

It is peculiarly fitting that our Association should hold its first meeting of the century in New York, because I find by referring to the history of the subject that New York City has been the great pioneer in many of the branches of the work in which we are engaged. For instance, the first interest in boating—boat racing—was started here in 1823; the first high school gymnasium was established here in 1825; the first baseball club was started here in 1845; Swedish gymnastics had their origin here in 1856; the first normal school of gymnastics was established here temporarily in 1866; the first athletic club of America was established here in 1868; I think the first Y. M. C. A. gymnasium was established here in 1869; the system of individual work and developing apparatus was brought out here in 1878, and our own Association had its birth here in 1885. So, I say, it is peculiarly fitting that we should hold the first meeting of the century here in New York City, and I can only hope that the fine program that has been prepared, and the papers and discussions which will be given, will arouse sufficient interest in the subject to compensate in some measure for the splendid efforts which have been made in our behalf.

The President then read an address on "Ideals in Physical Training."

IDEALS IN PHYSICAL EDUCATION.

BY DUDLEY A. SARGENT, M.D.,

Harvard University.

In reviewing the achievements of the past century in physical education we cannot help being deeply impressed with the substantial progress that has been made. You are all familiar with the general history of the subject, in this country at least, and I will not take your time this morning in renumerating dates or in recounting the epochs and events that have marked the successive stages in the advancement of our cause. My purpose is rather to take up the status of our work, physical education, at the present time; to consider some of the drifts and tendencies that are shaping its course; to make a critical review of some of the evils that beset us; and then to see if we cannot find some common ideals towards the realization of which we may direct our energies.

In considering the present status of physical training in the United States we find it established in some form or other in 270 colleges and universities; 98 are doing organized work; 72 require physical exercises; and 24 give credit for it in the course which counts for a diploma.

About 300 cities have introduced physical exercises into the public schools; 100 of them have special teachers.

There are about 500 Y. M. C. A. gymnasiums in different parts of the country, with a corps of some 300 physical directors and 80,000 members.

The North American Turnerbund has some 300 gymnasiums and about 200 instructors and some 50,000 members. There are perhaps 100 athletic club gymnasiums of one description or another, and a few out-of-door and public city gymnasiums. Then there are gymnasiums in private houses, churches, hospitals, sanitariums, army and navy depots, engine house stations, mission houses, industrial schools and many other institutions to the number of several hundred.

In addition to these forms of physical training there are a great variety of special athletic clubs for boxing, fencing, bowling, boating, canoeing, swimming, bicycling, etc. Then there is golf, tennis, baseball, football, with their ardent devotees and numerous following, together with the more passive forms of exercise, such as riding, sailing, driving, etc., which have many admirers. Taking all the sports, games and well established

forms of exercise into consideration, it is safe to affirm that they represent millions in capital invested and affect the lives of millions of our people.

The amount of money which a people is willing to spend in the furtherance of a movement is a pretty good indication of its value in their estimation, although if judged from an educational point of view this value would probably be considerably discounted.

If we were to estimate value of the century's efforts in physical training by the effects produced, the problem would be a difficult one on account of the many factors involved, and the increasing number of influences that tend to neutralize all the good effects that might be derived from systematic physical exercise.

Those of us who are engaged in making physical examinations know the effects which the practice of special forms of exercise have upon the individual, and it is fair to presume that the same exercise practised by many people will tend to have similar effects. Thus, when a great popular interest sweeps over the country for bicycling, lawn tennis, golf, boxing or football, the tendency will be to produce among the masses the same mental and physical characteristics that are recognized in the individual devotees of the popular pastime. It is hardly necessary for me to dwell at this time upon the special effects of these forms of exercise, for you are all more or less familiar with them. No one would be regarded as perfect from a mental, moral or physical point of view, and yet they have produced a most profound effect upon our people.

Bicycling, lawn tennis, and golf have been especially valuable to our women, inducing many to exercise who never exercised before. These sports have probably done more to overcome the evils of tight clothing than a whole century of preaching and lecturing on the subject.

Boxing, football, basketball, and other antagonistic games have done a great deal to lessen the evils of over-refinement and sentimentality, and they may be conducted in such a manner as to develop a firm character and a manly spirit. But there are certain inclinations connected with the development of competitive sports and antagonistic games that are not only detrimental to physical training in its best sense, but are also demoralizing to our youth and to the public in general.

Let us consider some of these drifts and tendencies. Thirty years ago amateur baseball was at its height in America, and there were well organized clubs in nearly every city in the Union. To-day there are a very few amateur baseball clubs outside of the colleges, and the interest in this once popular

sport is declining in our institutions of learning. Professional baseball has superseded amateur baseball in popular interest, and, although the game is just as beneficial from a physical and recreative point of view as ever, it does not have anything like the following it once had.

The interest in college boating culminated in 1875 when thirteen crews were represented at Saratoga. In some colleges this sport has been abandoned altogether; in a few institutions it has been re-established; and in some, especially at Harvard, there is a great revival of interest in boating, as many as twenty eight-oared crews being on the river at one time.

The practice of archery was quite generally established in this country in the early seventies, and there were numerous clubs of both sexes that rallied around this form of recreative exercise. The interest culminated in 1879, but at the present time there are few archery clubs in existence.

The higher gymnastics, so-called, attained their greatest prominence in the colleges and city gymnasiums in the early seventies. Boxing and wrestling contests attained their greatest popularity at Harvard in 1883, '84 and '85, and are now practically abandoned, although there are two instructors in boxing regularly employed at the gymnasium.

The interest in lacrosse and cricket has waxed and waned, but the games have never been entirely abandoned.

Field and track athletics have a strong following in the vicinity of New York, Boston and Philadelphia, but attract small audiences and little attention in the colleges and other communities compared to what they did a few years ago. The great city athletic clubs which once fostered track and field athletics now seldom have any representatives from their own membership in the public contests, and confine their attention to exploiting the athletic abilities of outsiders for the entertainment of their regular members.

Some of these athletic clubs, notably the Boston, act as patrons for school and college athletes, and do a great deal to encourage the practice of out-door sports and systematic exercise among their junior members. Many of these city athletic clubs, like the Orange, Washington, Detroit, St. Louis, Providence, Pastime in Brooklyn, Manhattan in New York, Staten Island, Fitchburg, Nationals in Louisville, Philadelphia, etc., have been given up, or turned into social clubs.

Notwithstanding the rise and decline of interest in many of the popular sports and exercises, there never was a time in our history when so much attention was given to sports in general as at the present day. As the interest in archery, roller skating, croquet, and boating declines, the interest in bowling, bicycling,

golf, canoeing or some other sport increases. Then again the interest in certain sports, although less intense, may in reality be very widespread and be participated in by a great many people. Now the important question is: What are the factors which cause some sports to decline and others to be perpetuated in popular favor?

In answer to this question we are forced to admit that fashion plays a very important part, bringing into vogue at one time sports which have but few valuable features, and sweeping away at another time exercises of the greatest importance. Some of the special forms of exercise like archery, fencing, Delsarte, etc., may be taken up as society fads and be "rushed" for a few seasons, and then become obsolete. Even the more serious forms of exercise are sometimes taken up by society because they are thought to be "the proper thing," without regard to their hygienic or educational value. In fact I should be rather loath to admit to this semi-scientific association how much of our work is without scientific or artistic value, because it is governed by fashion and caprice.

Again, the spirit of emulation and competition which we try so hard to foster and cultivate has its limitations, and it is a serious question just how far it can be carried without detriment to the cause we are striving to advance. A high spirit of emulation breeds rivalries and enmities and often stirs up bad blood and leads to the establishment of more or less permanent factions which may work great harm to a school or club. This is especially likely to be the case where competitions are confined to members of the club or to the different classes of a school or college. What discussions upon religion and politics are to social clubs so are athletic contests to athletic clubs, if the contests are limited to members.

The hardest struggles on the athletic field are frequently between classes or members of the same class or university teams. The feelings of bitterness and enmity often engendered by these hard contests in schools and colleges are softened and assuaged by the thought that knocks, strains and bruises must be endured in practice in order to enable the chosen school, college or university team to vanquish its rival from some other school, college or university. In this way a feeling of unity and consolidation is often established in an institution, which might otherwise be broken up by feuds and dissensions.

It is the lack of this feeling of unity on the part of the city athletic clubs, and the unwillingness of its members to endure the hardships of training for the severe, yet only contests which the other members come to see, which make these clubs after a few years fall apart simply from lack of any common interest to bind them together.

Another disrupting influence is the establishing of too high a standard. This is one of the evils of professionalism, and really marks the underlying difficulty of settling who is and who is not an amateur. The poorest professional must be a better performer than the best amateur in order to constitute himself a professional and be able to receive money for his services. But the receiving of money is a secondary consideration which follows the presumption of superior merits. This results from long and persistent practice or training such as a person is obliged to undergo in preparing for a profession or a life occupation. When, therefore, students, clerks, and young men who work with their brains rather than their muscles are urged to practise certain exercises or sports as a means of improving their health and physique, and are offered prizes or trophies of victory as incentives for them to train and compete, one of the first essentials of a fair contest is to see that those who enter the competition are of the same class or on somewhere near the same footing. Now if the contest is in rowing, and those who make a business of rowing are allowed to enter, the conditions would be unfair, as students who are engaged in their studies, or clerks with their bookkeeping through the working hours of the day, and who only take up rowing as a recreation or pastime, cannot compete on anything like equal terms with professional oarsmen. It would be just as absurd to expect the professional oarsman to compete on equal terms with the student in debating or solving mathematical problems, or with the clerk in bookkeeping or penmanship.

When, however, sports and pastimes are pursued with so much intensity as ends in themselves rather than as means to an end, and the devotees give so much time to practising them, that they have no time nor energy left to give to other pursuits, these persons are just as much professionals in the true meaning of that term as they would be if they received money for their services. This is the type of athletes that has been supported and exploited in the past by some of the large city and university athletic clubs. Although they have won prizes for their clubs, I can hardly believe they have won honors; indeed, I am sure that this style of athleticism has done great injury to the cause of physical training: first, by placing all the records so high that bona-fide amateurs will find great difficulty in surpassing them; second, by discouraging and literally driving out of existence the smaller clubs, that could not afford to follow the same tactics; third, by causing a decline in active interest among the members of these clubs who cannot give the time and attention from their business that will enable them to compete with the performances of star athletes, and who therefore do not compete at all. As long as the public are content to see performances

without regard to the status of the competitors, there will be a tendency towards professionalism which will have to be guarded against by very stringent rules.

One of the best ways of meeting this objectionable tendency in school and college athletics is for the authorities to insist that all contestants must not only attend to all of their school or college exercises, but that they must give evidence of having done a certain amount of work and attained a certain rank therein. If the school curriculum is what it ought to be, this will insure that the students will not give too much time to their athletics, and that the work in which they do engage will tend to give them a sound mind as well as a strong body.

I have dwelt at some length upon this tendency of the antagonistic sports and highly competitive games to exterminate themselves when not properly managed, because I deem it of the greatest importance that this fact should be thoroughly understood. There is no use denying the fact that athletic contests afford a stimulus to effort to a great many boys and young men which no other forms of exercise can give. The problem is how to control these sports and yet keep up the interest; how to eliminate the evil and yet preserve the good.

We have seen that when the competition was restricted to the one class school or club that hostile factions were formed and bitter rivalries engendered. Much of the hard feeling and enmity that existed between school and college classes years ago, when the practice of hazing was in vogue, was greatly intensified by class contests in football, rope pulling, cane rushing, etc. This feeling of enmity between classes is now fortunately a thing of the past in most institutions. I am not so sure, however, that it has not been transferred and even grown to a greater degree of intensity between rival schools and colleges, judging from the nature and tone of many of the alumni speeches that have been made and reported during the past winter. The rivalry in antagonistic games in many of our schools and colleges has now become so fierce and the desire to win has become so overpowering that there is not a little danger that amicable relations between some of these institutions may be overstrained.

One of the great charms to me of our association meetings is the opportunity presented for seeing those who are engaged in the same work in rival schools and colleges, and in learning from experience instead of hearsay that they are not fiends, ogres or cannibals, but real good-hearted fellows, having the same high aims and noble motives as ourselves, though they may have different ways of showing them. When we ask a friend to assume to be an enemy in order that we may arouse our fighting spirit and practise our animal instincts upon him, it is not at all

strange that the imaginary attributes which we repeatedly give to him are after a while difficult to efface. This is especially so if the fancied realism adds so much to our fierceness of attack and defence as to enable us to win a victory.

A man instinctively shrinks from falling upon another man's head under the ordinary circumstances of life, but a man so considerate of an opponent's head or person would not make a successful football player. When the papers were filled with denunciations of the West Point cadets for their rough and cruel practices upon underclass men, it did not occur to the general public that these are qualities that must necessarily be bred into the man who would become a professional soldier. A very much more agreeable way for us to become reconciled to these stern qualities in our young men, especially if we wish to raise an army, is to attribute these rough, cruel, and even fiendish qualities to those who happen to be for the time being our enemies.

We have all read about the inhuman cruelties of our Southern brethren during the Civil War, the barbarous practices of the Spanish soldiers, and the fiendish conduct of the Chinese Boxers and the Filipinos. By attributing diabolical qualities to an opponent we may excuse ourselves for trying to "do him up" or "put him out of the game." These are simply the remnants of primitive characteristics possessed by our ancestors, when those who were not members of the tribe were enemies of the tribe, whom it was one's first duty to wound or kill.

When rival boxers deliberately try to "knock each other out," and friendly baseball players "spike" a runner, or throw dust in a baseman's eyes; when the fair devotees of basketball hiss every attempt of the visiting team to make a goal; when grave and dignified professors rush up and down the side lines of the football field shouting "down him," "kill him," and delicate ladies, who but a moment before shrank from witnessing the "brutal" game, with flushed cheeks and staring eyes wildly shriek their approval: one might reasonably ask if this also is not an exhibition of some of the recurrent traits of our barbaric ancestry. Of course, these are exceptional occurrences, but if you have any real doubt as to the passions which are swaying the minds of most of the spectators, as well as the participants, during an exciting football game or boxing match, just watch the faces of the audience during these antagonistic exercises. To be sure, there is the joy of victory to the side that wins; there is also the chagrin of defeat to the side that loses; and it is a question whether the prolonged depression which follows the defeat does not more than offset the temporary pleasure of the victory.

It is certainly true that the feelings engendered between institutions by violent athletic contests do not tend to unite them, when

harmonious relations and unity of spirit seem altogether desirable. We have seen that when athletic contests were confined to the members of different classes in the same institution that the rivalry became intense and the spirit bitter, and that the only way to relieve the tension and hard feeling was to unite in competition against some other institution. As this movement, which has now been in operation for twenty or thirty years in some of our colleges, is beginning to breed the inevitable bitterness of feeling which sometimes finds expression in a phrase that consigns a whole institution to Hades, the question arises whether these rival colleges cannot unite against some common enemy or institution, and thus work together in harmony. The union of Harvard and Yale against Oxford and Cambridge in their athletic games in England, and the American team at Paris and at Athens, are illustrations to the point. In arranging for international contests to take place every four years in which the winners in the intercollegiate contests could be represented, a new interest and a new zest would be given to athletic games, and their real significance might be brought home to our people, for they would soon learn that this would be one of the best ways of preserving our national unity.

The rivalry that exists between nations is a fundamental one, and is based largely upon differences in race, blood, nurture and environment. There is no national rivalry between States, cities and institutions in our country founded upon the personal qualities of those who were born, bred and educated therein. Would that there were! A city baseball nine or a college athletic team may be made up of representatives from all parts of the country. Whether these men are successful athletes or not will depend largely upon their own superior natural abilities, their previous training, and the way in which they are handled or managed.

Why a city, a college or a community should pride itself upon the achievements of a baseball nine or an athletic team which it never produced is one of the things that I have never been able to comprehend. The only justifiable ground upon which any such pride could be based is that these athletic teams represented the result of a system of physical training open to all, in which the victorious athletes had had to fight their way up step by step through preliminary contests until they won a place on the best or university team. And even then the only thing worthy of recognition in these prolonged contests by a great university would be the triumph of better blood, better brains, better hearts, better lungs, better muscles and tissues. If the totality of these valuable essentials to life, health, happiness, and success have not been increased in the college community at large by the influence of

athletics, then these much lauded exercises may be considered not only of doubtful value but even of positive injury to an institution of learning. Happily the average physique in our secondary schools and colleges is improving, however slowly.

At the present day every alumnus rejoices in the athletic victories of his school or college team, because he thinks the public will consider the achievements of this team a fair representation of what his institution is doing for the physical training of its youth. How seldom this is true! In intellectual training all school men are required to come up to a certain minimum standard of excellence before they can enter college, and again before they can receive their diplomas. There is no such incentive to keep the mass of students up to a required physical standard, and the gulf between the lowest and the highest is great indeed.

A few years ago the college gymnasium directors, believing that a moderate degree of physical strength was the fundamental basis not only for all forms of athletics but for health itself, decided upon a uniform system of strength tests by which to gauge certain functional powers in their respective pupils. The test consisted of all-round trial of strength of back, legs, arms and chest, in which the sum total of the several trials was to represent the total strength of the individual.

After the candidates for all the athletic teams have been chosen, a great many men who desire to have something definite to compete for are left without any incentive. One object of the college strength test is to furnish an incentive for a large number of men to keep up their physical exercise by giving them an opportunity to record their improvement and compare it with others measured by the standard. The method adopted has been in use at some of our colleges for over twenty years, and now offers a basis of comparison between two generations, and the individual records of over twenty-five thousand persons. In order to encourage a great number to compete, every college in the league agrees to send in to the committee a list of its fifty strongest men, and the college having the fifty which make the largest total wins the honors in the contest for the year. Last year Columbia was first on the list with a total of 59,489.4 points, in which each of the fifty men represented averaged 1,189.8 points.

Now the point which I wish to make is that, notwithstanding the high average made by the first fifty men representing Columbia and the other colleges in the league, in all probability the average of all the men examined would not be much over 500 points. In other words, 50 per cent. of all the men examined would fail to make a strength test which was equal to half of that surpassed by the first fifty. While if we make comparisons with the individual men who head the list, we find that over half

of all those examined fail to make a test equal to one-third of that attained by the leaders..

Now these facts emphasize three things: the stimulating effect of a comparative record or contest upon a considerable number of men; the remarkable increase in functional power that can be attained by systematic training; and the large number of college men who never begin to realize one-half of their possibilities in the way of physical improvement.

The great objection to all forms of athletic competitions and strength contests is that after a while, as the standard rises, they are likely to be pursued as ends in themselves, as I have stated before, rather than as means to an end, and that end the betterment of the whole organism. But unfortunately this objection is not inseparable from mental contests, and in both instances those men come to the front whose constitutions are best adapted to stand the strain to which they are subjected.

By this method of selection our higher schools and colleges are fostering two distinct types. One type devotes itself to the supreme development of the mind, and the other to the supreme development of the body. The latter type is best calculated to survive, because it has to meet certain mental requirements of the faculty. But neither type represents the average student, and yet it is the condition of the average student that shows what our schools and colleges are doing for the community. The more experience I have in teaching physical training and the more I observe its results, the more I am convinced that the highest ideal for which we should strive is the improvement of the individual man in structure and in function. This was the conclusion that I came to some twenty-five years ago, and time and experience have given it confirmation.

With this ideal in mind, all the diverse forms of exercises and games, all fads and specialties, all methods and systems may be weighed in the balance and credited for what they are really worth. For it is not a runner, a jumper, a boxer, a ball player, an oarsman or a gymnast that we are trying to produce, but the highest type of a physically perfected man. This forbids excessive development in any one direction, which specialists are constantly striving to attain. It also makes over-exercise and over-training inconsistent with the object in view. It furnishes a constant incentive to well directed efforts and right methods of living. It is not necessary to hunt for a competitor, for one is always in competition with himself, endeavoring to make his condition to-day better than it was yesterday, and so on from week to week and from month to month. If one wants an opponent, he accepts him as a friend. For as Burke says, "He that wrestles with us strengthens our nerves and sharpens our skill. Our antagonist is our helper."

The great thing to be desired and attained is that prime physical condition termed *fitness*. Fitness for work, fitness for play, fitness for anything a man may be called upon to do. Is not this a condition worth striving for? How few of us realize the dignity and importance of the work in which we are engaged. Trying to assist nature in developing and perfecting her handiwork,—not simply mending bones, patching wounds and relieving functional disturbances—but trying to lift man on to a higher plane of living, by improving the structure of his bones, muscles, nerves and tissues, and increasing the functional capacity of his whole organism. This is the highest kind of constructive work, in which the building of all other material structures sinks into utter insignificance.

If there are those among you who sometimes get disheartened and discouraged because you think your particular branch of service is not appreciated, I trust you will let this ideal take possession of you. Think into your very soul the true aims and noble purposes of your profession. Then if you do not feel inspired to go on with your glorious work with renewed courage and greater energy you are not made of the stuff of which good teachers of physical training are made.

If you do become possessed of the true ideals, all your work will assume a new significance to you. Balls, bats, wands, Indian clubs, dumb-bells, chest-weights, ropes, ladders, bars, and all the apparatus of the gymnasium will take on a new importance. Free exercises, dancing steps, plays, games and "sleights of art and feats of strength," even the schoolboys' "stunts"—all will be brought under tribute and made to aid you in getting hold of some indifferent soul, and inducing him to make efforts for himself. All criticisms against childish sports, trivial plays and undignified movements and exercises will be simply laughed to scorn; for what dignity has any movement or exercise except the dignity of the mind that directs it?

Something of this spirit must have possessed the minds of Agesilaus and Socrates of old, who did not disdain to practise the child's play of "riding a stick" for exercise. It is the same spirit that induces many brain overworked business and professional men, many closely confined clerks and shop girls, to take regular systematic exercise at their homes or boarding places, when golf, tennis, the bicycle and the gymnasium are inaccessible. And I regret to say that it is a lack of this spirit that puts so many of our college athletes out of condition after they have entered upon their life's work. Finding no opportunity to practise their favorite sport, they find no incentive for exercise of any kind, and frequently break down in health for want of it. There are scores of such men in New York City to-day, and their early

breakdown is not unfrequently attributed to over-indulgence in college athletics.

In some instances this may be true, but the fundamental weakness in the whole athletic movement at the present time is a failure to recognize the primary objects for which athletic exercises, like other physical exercises, are fostered and encouraged; in other words, a failure to recognize proper standards and high ideals.

In consequence of this difference of aim and motive many of us are kept busy protecting students against the excesses of some forms of athletics while in college, and defending athletics against the attacks of some students after they leave college. If, therefore, we would preserve exciting games and competitive exercises as a part of our stock in trade as a means of physical development, we must be constantly on our guard to detect abuses and restrain excesses. If on the other hand, we would avail ourselves of the many excellent exercises which from their nature are not likely to be carried to excess, we must never weary of our efforts to arouse in our pupils an ambition and incentive to try them for the development and improvement of their own better selves.

This is the vital principle back of all our work, and if the teachers of physical training will imbibe a little enthusiasm for physical perfection for its own sake and put a little of the spirit of helpfulness into their daily work, they need never despair of appreciation or employment, for the world is waiting for their efforts. With these ideals in view we may look in the future for the advancement of our cause with reasonable hope and joyous expectation.

The Chair announced that the next order of business, according to the program, would be the matter of organization. According to the present Constitution, it would be recalled, the Council simply turned the whole matter of management over to the Convention, and with the closing address of the President the present administration, of course, ended its services, with the exception of such reports as the Council might have to offer. The next order of business, then, would be the nomination of a Chairman of the Convention. Nominations were then declared in order.

Moved and seconded that a committee of three on credentials be appointed. Carried.

The Chair thereupon appointed Dr. Fitz, Dr. Gulick and Dr. Savage a Committee on Credentials, and requested those having credentials from local societies to report to such Committee, and

announced that the Committee would retire to consider such credentials.

Dr. Gulick asked to be excused from service on the Committee, and suggested the selection of some person better acquainted with the personality of the societies.

The name of Mr. Hillyer was suggested and substituted for that of Dr. Gulick.

On motion duly seconded, the Convention thereupon adjourned for fifteen minutes, or subject to the call of the Chair.

Reconvened at 3 P. M.

The Convention was called to order, and the Chair stated that Mr. Hillyer would announce the official delegates, and also the list of members at large who were entitled to vote.

Mr. Hillyer thereupon presented the following report:

REPORT OF THE COMMITTEE ON CREDENTIALS.

The following societies are represented, each with the appended list of delegates:

BOSTON.

DELEGATES.

Dr. D. A. Sargent,
Mr. C. Eberhard,
Mr. M. Anagnos,
Dr. Laura A. C. Hughes,
Mr. Hartvig Nissen,
Miss Jennie B. Wilson,
Baroness Rose Posse,
Dr. G. W. Fitz,
Mr. M. B. Gilbert,
Dr. G. L. Meylan,
Miss Sarah S. Webber,
Miss H. W. Narey.

ALTERNATES.

Dr. Louis Collin,
Mr. Ernest Hermann.

NEW YORK.

DELEGATES.

Dr. Savage,
Miss Bancroft,
Mr. Hillyer,
Mr. Barker,
Miss Moseley,
Miss Hunter,
Dr. Gulick,
Mr. Bolin,
Dr. Brown,
Mr. Bergquist,
Miss MacMartin,
Dr. Truslow.

ALTERNATES.

Dr. Wallin,
Miss Brenner,
Dr. Requa,
Dr. Taylor,
Miss Beattys,
Mr. Haug,
Miss McElroy,
Miss Peck.

PHILADELPHIA.

DELEGATES.

Dr. Babbitt, Miss Hopkins, Dr. Ehinger.

NEW HAVEN.

DELEGATES.

Dr. Seaver, Mr. Leyerzapf, Dr. Arnold.

PITTSBURG.

DELEGATE.

Miss Stoner.

NEBRASKA.

DELEGATE.

Dr. W. W. Hastings.

DELEGATES AT LARGE.

Dr. McKenzie,	Mr. A. L. Cross,	Dr. J. H. McCurdy,
Miss Wiggins,	Miss LeGarde,	Dr. Raycroft,
Miss Marston,	Miss Thayer,	Miss Brigham,
Miss Scarborough,	Miss Walton,	Mr. Day,
Miss Valentine,	Miss Chapin,	Dr. Cummings,
Mr.Thompson,	Miss Avery,	Miss Healey,
Miss Johnson,	Miss Paine,	Mr. Bowen,
Mr. Denman,	Dr. Groszmann,	Mr. Johnson,
Mr. Leland,	Miss Hill,	Miss O'Connor,
Dr. Young,	Mr. Affleck,	Miss Cary.

The Chair then declared it important that each group of delegates appoint one to represent them and deliver the vote, and that it was also important that a number of alternates be appointed in place of the delegates absent, to keep the quota full in order to get full representation for each society.

On motion duly moved and seconded, the report of the Committee on Credentials was thereupon accepted.

It was then moved that the Convention proceed to the election of a Permanent Chairman. Carried.

On motion of Dr. McKenzie, Dr. Luther Gulick was elected Chairman of the Convention.

Dr. Gulick said: Ladies and Gentlemen—I appreciate the honor and will endeavor to perform your wishes faithfully. The next order of business, I believe, is the election of a Secretary. Nominations are in order for a Secretary for the Convention.

On motion of Dr. Savage, Dr. James A. Babbitt, of Haverford, Pa., was placed in nomination for Secretary of the Convention. There being no other nominations, on motion, duly seconded,

nominations were closed, and Dr. Babbitt duly elected Secretary.

Mr. Hillyer suggested the appointment of a Committee on Revision of the Constitution. No action was taken.

It was moved and seconded that the Convention proceed to the election of a Vice-President and second Secretary. Carried.

On nomination of Dr. Seaver, Mr. J. Blake Hillyer was appointed Vice-Chairman, and on similar motion, after the refusal of Dr. Ehinger and Mr. Bolin to serve, Miss Ada F. Thayer was appointed Vice-Secretary.

The Chair then announced the next order of business to be reports of officers or committees—the report of the Secretary, the report of the Treasurer, and then the reports of standing committees.

At this point the question was raised as to whether it would not be in order to take into consideration the possible objection to allowing those members to vote who were not delegates or delegates at large, and the Chair was asked for a ruling.

The Chair thereupon ruled the point not well taken, and stated that unless there were objections to the contrary the precedent of the Boston meeting would be followed, which allowed all members present to vote.

The Recording Secretary then presented her report, as follows:

REPORT OF THE RECORDING SECRETARY.

Soon after the Convention held in Boston in April, 1899, a meeting of the American Association for the Advancement of Physical Education was called in Boston, to elect members of the Council for the next two years.

The choice resulted in the election of:

Dr. D. A. Sargent,	Dr. G. W. Fitz,
Dr. Edward Hitchcock,	Dr. J. W. Seaver.
Dr. Walter Channing,	Mr. Christian Eberhard,
Miss Hope W. Narey,	Dr. Mary R. Mulliner.
Baroness Rose Posse,	

ALTERNATES.

Dr. E. M. Hartwell,	Mr. H. Nissen.
Miss Mary Allen,	

At a special meeting of the newly elected council the following officers were chosen:

President, Dr. D. A. Sargent.
Vice-President, Dr. Edward Hitchcock.
Treasurer, Mr. Christian Eberhard.
Corresponding Secretary, Dr. G. W. Fitz.
Recording Secretary, Baroness Rose Posse.

The members of the various committees were afterward appointed as follows:

ON FINANCE.

Dr. Walter Channing, Dr. D. A. Sargent.
Baroness Rose Posse,

ON THEORY AND STATISTICS.

Dr. Edward Hitchcock, Dr. J. W. Seaver,
Dr. G. W. Fitz,

ON PUBLICATION.

Dr. G. W. Fitz, Dr. D. A. Sargent.
Dr. Mary R. Mulliner,

ON TECHNICAL MATTERS.

Dr. D. A. Sargent, Mr. Christian Eberhard.
Miss Hope W. Narey,

Dr. E. M. Hartwell was asked to serve as an associate member of the Committee on Publication.

The Treasurer's report for the year 1899 showed a balance of two hundred and eighty-seven dollars and seventy-three cents ($287.73) in the treasury January 6, 1899, and seven hundred and seventy-six dollars and sixty-six cents ($776.66) received during the year, making a total of one thousand and sixty-four dollars and thirty-nine cents ($1,064.39). The expenses for the year were one thousand and thirteen dollars and sixty-four cents ($1,013.64), leaving a balance in the treasury of fifty dollars and seventy-five cents ($50.75).

The report of the Corresponding Secretary for the year 1899 showed that five hundred and sixty-seven members had paid dues for 1899, twenty-two had resigned, and one hundred and twenty-eight new members had been received into the society.

In the fall of 1899 some discussion was raised as to the relation of the local societies to the National Society, especially in the matter of collecting dues. The Council decided as follows:

Local societies cannot have as members with full powers persons who are not also members of the National organization. Representation in the National Convention shall be based only on the number of regular members of the Society. The dues for the National Association shall be collected by the local secretaries and transmitted to the Corresponding Secretary of the National Society.

During the year 1900 the matters most worthy of notice were as follows:

The granting of the editor of the *Review* a salary of three hundred dollars from the amount accruing from advertisements in the *Review;* the sending of delegates by the Society to the Paris Exposition and to the "feste" of the National Amateur Gymnastic Union held in Philadelphia in June; the outlining and endorsement of Dr. Sargent's scheme for changes in the Constitution; the conference with Mr. J. Blake Hillyer, representing the New York Society, with regard to matters relating to the next Convention of the Association. At this conference it was voted that the New York Society be empowered to plan and carry out the program for the Convention, subject to the approval of the Council. That each member of the A. A. A. P. E. in attendance at the Convention not belonging to a local society should be entitled to one vote on all matters before the Convention. Each society should be entitled to be represented by delegates. Each delegate should represent ten members, with power to vote for all these members.

It was also voted that the New York Physical Education Society should be requested to confer with a committee from the Council, consisting of the President, the Vice-President and the Treasurer. For the year 1900 the Treasurer reported a balance on hand Jan. 5 of $50.75.

Receipts for year.	$956.03
Expenditures.	931.67
Leaving balance on hand.	75.11

The Corresponding Secretary reported 110 new members during the year, with 703 old members in good standing. Two hundred and fifty members had been dropped from membership and 13 had resigned.

The principal features of the meetings since January 1, 1901, have been the selection of a committee consisting of Dr. Sargent, Dr. Mulliner, Dr. Fitz, Dr. Seaver and Miss Narey to draft a revision of the present Constitution of the A. A. A. P. E.; and the voting of $150 as a maximum contribution towards the expenses of the coming convention.

BARONESS ROSE POSSE,
Recording Secretary.

Moved and seconded that the report be accepted.

The Chair then raised the question as to whether the action of the Council in reference to the matter of allowing members at large to vote could be done legally, as it was an alteration of the Constitution.

Mr. Bolin rose to a point of order as to the propriety of a motion that all members of the A. A. A. P. E., save delegates from

the New York section, be allowed to vote in the Convention. Chair rules that the precedent of the Boston meeting allows such members the privilege of voting, unless objection be raised.

Dr. Seaver—I would like to offer an amendment to this motion, that the report be accepted with the statement appended that the action of the National Council as reported, regarding the liberty of members to vote, shall be recognized as advisory rather than as a legal rule of our organization.

Seconded.

The Recording Secretary stated that there seemed to be some misunderstanding. It was merely an interpretation, not a rule.

Dr. Seaver—It seems to me that, if we adopt it, it stands as the opinion of the meeting.

Recording Secretary—It is merely a report of what has been done.

Dr. Seaver—I think it is recognized that all organizations vote on the acceptance or rejection of the report of the Secretary. We to-day have the right to do this. It may be an account of actual business performed, but when we place upon our records matters that change what to many seems the fundamental organization of our Association, we should go with some care and deliberation. The vote of the Council in Boston, or in New York, or any other city, is simply their way of interpreting, it may be, the Constitution. If we accept that it becomes our interpretation of it also.

The Chair—May the Chair suggest that the report be adopted, and that the Secretary of this meeting be instructed to have some such phrase as this follow the report: "The Convention understands and accepts this recommendation in an advisory way."

The motion that the report be received was then put and carried.

The Corresponding Secretary thereupon presented his report as follows:

REPORT OF G. W. FITZ AS CORRESPONDING SECRETARY.

As corresponding Secretary of the A. A. A. P. E., for the years 1899 and 1900 I have the honor to submit the following report:

The affairs of the A. A. A. P. E. have prospered. The membership in the Association has been steadily growing, and the interest in the work as evinced by inquiry for membership and demand for the publications of the Association, has been active. This increase has been conclusively shown by the necessity for

enlarging the edition of the AMERICAN PHYSICAL EDUCATION REVIEW from 800 in 1897 to 1,200 for the March number of the year 1901.

The REVIEW has been published regularly in the interval and its contents have increased in so far as the funds of the Association have permitted. It has not been possible to publish all of the important articles submitted, for the reason that funds were not available, and hence some valuable material has been lost to the Association. For the same reason it has not been possible either to reprint or to summarize many of the most important articles bearing upon Physical Education published in other scientific journals. It is therefore to be hoped that this Convention will take such steps as will guarantee the funds necessary to fulfill the ambition of its promoters to make the REVIEW a complete exponent of physical education.

The Association has been able to undertake the publishing of reprints of a few valuable articles upon physical training, for which there has been a popular demand. These, together with the old reports and back numbers of the REVIEW, form a valuable part of the assets of the Association. As the sale of these publications has averaged nearly a hundred dollars a year, their value as an important source of income and a wise investment of the funds of the Association can be readily seen. The resources of the Association in this respect are shown in the following list:

ASSETS OF THE ASSOCIATION.

Reports of the Association:
1885, 137; 1886, reprints from, 14; 1887, 56; 1888, 1.
1889, 12 bound, 7 unbound; 1891, 53; 1892, 75; 1893, 100.
1894, 169; 1895, 371. Index to Reports, 775.

A. P. E. Review:
Vol. I, 1896, 58.
Vol. II, 1897, No. 1, 5; No. 2, 5; No. 3, 32; No. 4, 71.
Vol. III, 1898, No. 1, 84; No. 2, 235; No. 3, 255; No. 4, 304.
Vol. IV, 1899, No. 1, 263; No. 2, 158; No. 3, 217; No. 4, 212.
Vol. V, 1900, No. 1, 97; No. 2, 131; No. 3, 148; No. 4, 80.

Reprints:
Physical Training, E. M. Hartwell, 687.
Mental Fatigue, H. T. Lukens, 199.
Resumè of Quetelet's Treatise on Man, W. W. Hastings, 170.
The American Girl of To-day, G. J. Engelmann, 380.
Athletics and Games of the Ancient Greeks, E. M. Plummer, 546.
Report of the Boston Physical Education Society to Suggest a Substitute for the Manual of Arms as a Means of Physical Exercise in the Military training of School-Boys, 300.

Old Constitution and By-Laws, etc., of the Association, 450.

The early records of the Association were found to be in such unsatisfactory condition as to be of little value. Your Secretary has endeavored, however, through an analysis of existing records, to make up a statistical table of the growth of the Association which he herewith submits:

A STATISTICAL SUMMARY OF THE DEVELOPMENT OF THE A. A. A. P. E. AS SHOWN BY INCOME AND MEMBERSHIP.[1]

Year.	Total Income (including balance from previous year).	Income from Dues.	Members.	New Members.	Resigned or Dropped.
1885	$34.00	$34.00	49		
1886 and 1887	127.20 (2.20)	92.00	119		
1888 and 1889	98.00 (52.74)	98.00	190		
1890	245.00 (?)	245.00	333		
1891	315.00 (?)	272.00	514		
1892	519.00 (00.00)	406.00	640		
1893	579.66 (212.66)	[3]367.00	635		
1894	[2]799.00 (2.90)	[3]445.10	560		
1895	570.34 (250.44)	131.00	661		
1896	533.51 (?)	418.00	661		
1897	926.07 (130.51)	516.00	550	166	
1898	894.31 (74.75)	[4]707.50	671	96	112
1899	1,064.39 (287.73)	607.00	[5]567	126	22
1900	1,006.78 (50.75)	645.49	703	110	263
1901 (to Apr. 1)					

The contrast in the early years of the Association between the printed list of members and the income from dues for the corresponding year, shows that the rule that members in arrears for two years should be dropped, was largely held in abeyance, and that there was a large floating or temporary membership. The solution of the membership problem in connection with the payment of dues has been one of the most difficult duties of your Corresponding Secretary, but it has been in so far successfully accomplished that the new secretary will find the system for the supervision of the payment of dues in good working order.

In closing my six years' service as Corresponding Secretary, I wish to express to the Association my appreciation of its uni-

[1]Made up from the Secretaries' and Treasurers' Books and Reports as far as obtainable. [2]Including a contribution of $341.00 by some members to a Publication Fund. [3]Including both dues and sale of Proceedings. [4]Including back dues from a number of old members. [5]This number of members have actually paid dues for 1899.

formly courteous and hearty co-operation in my work, and to congratulate it upon the strong and influential position which it to-day occupies.

Respectfully submitted to the Convention,
GEORGE W. FITZ, Corresponding Secretary.

Moved and seconded that the report of the Corresponding Secretary be accepted. Carried.

The Treasurer thereupon presented his report as follows:

REPORT OF TREASURER A. A. A. P. E. COVERING THE PERIOD FROM JANUARY 1, 1899, TO APRIL 15, 1901.

Year 1899—		
Balance on hand January 1, 1899........	$287.73	
Receipts during the year for dues, reports, reviews, reprints, etc..................	776.66	
Total............................		$1,064.39
Expenditure's during year of Secretary's department, for printing of REVIEW, etc.		1,013.64
Balance on hand December 31, 1899......		$50.75
Excess of Expenditures over Receipts (Deficit) for year....................	$236.98	
Year 1900—		
Balance on hand January 1, 1900........	$50.75	
Receipts during year for dues, reports, reviews, reprints, advertisements, etc...	956.03	
Total............................		$1,006.78
Expenditures during year of Secretary's department for printing REVIEW, etc...		931.67
Balance on hand December 31, 1900..		$75.11
Excess of Receipts over Expenditures (Surplus) for year..................	$24.36	
Balance on hand January 1, 1901........	$75.11	

1901, January 1 to April 17—		
Receipts from January 1st to April 17th for dues, reviews, reports, reprints and advertisements.	496.31	
Total.		$571.42
Expenditures during same period of Secretary's department for printing of REVIEW, reprints, etc................		409.03
Leaves balance on hand April 17, 1901...		$162.39

In a more detailed and itemized form the expenditures for the period covered by this report have been as follows:

For printing of PHYSICAL EDUCATION REVIEW:

1899.			
Jan. 10.	December number, 1898......	$108.91	
May 15.	March number, 1899.........	181.69	
Aug. 2.	June number, 1899...........	179.05	
Dec. 30.	September number, 1899.	91.89	
	Total.		$561.54
	Expenditures of Secretary's department..		215.02
	For 1,000 Dr. Hartwell History reprints..		85.79
	Expenditures for Convention: for Hall Rent, $25.00; Badges, $34.20; Janitor's services, $10.00; Stenographic Report, $25.00.		94.20
	Stationery, minor printing and sundries during the year.		57.09
	Total Expenditures for year.		$1,013.64

For printing PHYSICAL EDUCATION REVIEW:

1900.			
Feb. 3.	December number, 1899.	$83.60	
May 4.	March number, 1900.	172.59	
Aug. 15.	June number, 1900.	118.33	
Nov. 6.	September number, 1900.	93.59	
	Total.		$468.11
	Expenditures of Secretary's department for year.		211.84
	Salary of Secretary-Editor.		168.70
	Dr. Hastings' Reprint.		25.00
	Stationery, minor printing and sundries for year.		58.02
	Total Expenditures for year.		$931.67

For printing PHYSICAL EDUCATION REVIEW:

1901.			
Feb. 4.	December number, 1900......	$112.50	
April 16.	March number, 1901.........	141.05	
	Total............................		$253 55
April 16.	500 Engelmann Reprints...............		30.00
	Expenditures of Secretary's department (including on account of salary, $2.82).		118.38
	Minor printing, sundries, etc.		7.10
	Total Expenditures for period from January 1 to April 17, 1901.......		$409.03

CHR. EBERHARD,
Treas. A. A. A. P. E.

Moved that a committee of three be appointed to audit the report.

Dr. Sargent—In the absence of the Chairman of the Finance Committee, I would state that the Treasurer's report has been audited by that committee. I would also like to take the opportunity to push in my little report of the Technical Committee. The Technical Committee report that they have had no matters referred to them since last year, so that they have no report to state.

Moved and seconded that the report of the Treasurer be accepted. Carried.

Dr. Geo. W. Fitz, as Chairman of the Committee on Publication and Pamphlets, then presented his report.

Moved and seconded that the report of the Chairman of the second committee be accepted. Carried.

The Chair stated that he would call at the start for the report of the Committee of the Council with regard to the proposed revision of the Constitution and By-Laws.

Mr. Hillyer announced that the badges which he had distributed would do in lieu of tickets, and would admit the wearers at the doors, and no special tickets were needed for delegates or members of the Association. If in need of tickets for their friends, or if there were others who needed tickets, he referred the applicants to Mr. Barker, who would supply them with two at most for any one exhibition. The tickets were getting scarce for the entertainment that night and Saturday afternoon.

Mr. Bolin submitted a letter of invitation for inspection of the work of Zander Institute, 20 West Fifty-ninth Street, and the Chair asked Mr. Bolin to accept the invitation in the name of the Society.

Dr. Sargent then announced that as Chairman of the Committee on Revision of the Constitution, which was a matter which would, of course, be referred to the Committee, he would be glad to be called upon by that Committee to give the details which were in the minds of the Committee of the Council when the Constitution was drawn up.

Moved by Dr. Fitz, and duly seconded, that the Committee on the Constitution of the Convention be formed by appointment by the Chair—a Committee of Five, to which Committee this report should be referred. Carried.

Mr. Hillyer asked the Chair to name the Committee.

The Chair replied that the Committee would be named in the evening.

Mr. Hillyer—When will they report?

The Chair—Will it do to ask them immediately after the close of the meeting this evening?

Mr. Hillyer—Why can't they report right after the Section meeting?

The Chair—I will see that they get together.

Dr. Fitz thereupon reported for the Committee of Nine on Normal Schools.

Moved and seconded that the report be accepted.

Dr. Fitz requested that it be referred to the Committee.

The motion to receive the report was then entertained and carried.

Dr. Sargent said with reference to the report of the Committee of Fifteen, that the instructions were of such a nature that they had to deviate somewhat from the Constitution, as they felt that the Committee, to be of service to the Association, should be made up largely of men of distinguished reputation outside of the organization. Their report would then be received by the public as unprejudiced, as the unbiased opinion of men whose reputations are acknowledged throughout the country. It was very difficult to make up that committee. Dr. Hyde was appointed Chairman, and Dr. Hartwell, Secretary. The Committee have had a preliminary meeting. The various committees are instructed to report next January, and the report will probably be the most exhaustive made on the subject in this country. It will in all probability be printed by the Committee on Education, and given a large circulation.

Moved and seconded that the report of progress be accepted. Carried.

Dr. Fitz called attention to the fact that there were copies of the old Constitution on the stage, and suggested that those not familiar with it procure copies and compare it with the new Constitution, reprints of which were also on the stage.

Dr. Savage announced that the meeting, in the afternoon, of the Section on Elementary Schools would be held in the Convention hall, and it had been suggested that in assembling, the members keep to the left side of the room as far away from the noise as possible, in order that the speakers could be heard clearly in reading the papers under discussion. The Section on Colleges and Schools would meet in the Examination Hall, on the fourth floor. The book exhibit was in Room 519, on the fifth floor.

The Chairman—An exhibit of books on physical training. All those interested in the subject should visit Room 519.

Dr. Gulick then requested those wishing to talk with each other during the sessions to do so outside the hall of the Convention. The Chair had been too lenient in the matter of discussion. Hereafter the Convention would abide by the ruling that the maker and seconder of each motion be allowed to speak twice; others but once, excepting where every one had had a chance to be heard.

There had been some misunderstanding in regard to the dinner on Saturday evening. The slips that were sent out were sent to those named on the list published a year ago in *The Review*. None of the members who had come in since had received slips. The dinner was open to every member of the society—the Association—and it was requested that those who had not received slips, who would like to, should procure the same. He had purposely delayed the binding until after the meeting. They would be presented in a large leather envelope, in order that every one might come in who wished to do so. The tickets could be procured from him. They were limited to one hundred and fifty.

Mr. Babbitt asked if there were not some who had not received slips to whom it would be interesting to know what was meant by the letter to Dr. Hitchcock?

Dr. Gulick stated that the dinner was complimentary to Dr. Hitchcock, both because they loved him and because he and the higher interests of physical training were identified; and all who felt that way, who were members of the Association, whether they knew Dr. Hitchcock or not, were invited to extend to him their good wishes and congratulations upon his long service to the cause of physical training. The dinner was to be at the Hotel Manhattan; reception at 7.00; dinner, 7.30.

On motion, duly seconded, the Convention adjourned.

AFTERNOON SESSION, 3 P. M.

HALL OF THE BOARD OF EDUCATION.

Section Meetings—Section of Colleges and Secondary Schools.
R. Tait McKenzie, M.D., Chairman, McGill University,
Montreal, Canada.

Dr. W. W. Hastings, of Springfield, read "A Glossary of Nomenclature in Physical Training." The paper was prepared by Mr. A. L. Fish, of the International Training School, Springfield, Mass.

Dr. F. J. Simpson, of Hartford, Conn., read a paper on "The Need of Physical Training in Public Schools."

THE NEED OF PHYSICAL TRAINING IN OUR PUBLIC SCHOOLS.

BY FREDERICK T. SIMPSON, M. D.,
Hartford, Conn.

The common school system of the American people has been in existence now some fifty or sixty years. It has practically revolutionized the life of our young people. Whereas the boys and girls of previous generations spent all their time, except a few weeks in the winter, in out-door sports or in farm and household employments, the boys and girls of the past fifty years have spent from eight to twelve or more of their years of growth almost literally in the atmosphere and exercises of the school. It is not generally realized to what extent the time and the energies of the child are appropriated by the present educational program. Five hours a day for forty weeks in the year the children are engaged in mental exercises purely within the school, and in the higher grades from one to three hours per day out of school. But this is not all. Additionally and inevitably comes the outside reading of literature of all kinds encouraged by parents and teachers alike. Altogether a habit of almost continuous sedentary mental occupation is established which prevails largely, even in vacation hours. In fact, a large proportion of children have to be fairly driven out of doors for fresh air and exercise. Thus the life of young people, which was in former generations out-door, active, corporeal, has become in-door, sedentary, intellectual. The recent revival of interest in athletics—such as football, golf, tennis—affects practically as yet only the older and well-to-do portion of the community, and is itself a witness to the conditions just described.

Now, in accordance with well-known physiological laws,

we should expect this change from exercise of body to exercise of brain, so profound as it is and affecting as it does the children of all classes of people, to have been followed by deteriorating changes in the physical organism. For a score of years physicians have been accumulating evidences of such injurious effects of the present school curriculum along several important lines. Let us see what the character of this evidence is. An excellent and most obvious illustration is seen in the case of the eye.

Investigations on an immense scale by many men in different countries have shown that myopia, or short-sightednness, is the direct result of application to study. The statistics of Erisman showed that with two hours of study per day, 19 per cent. of school children became short-sighted; with four hours, 29 per cent., and with six hours 40 per cent., became short-sighted. In other words, the function of the eye for distant vision is weakened or cut down one-quarter or one-half in a ratio directly proportional to the hours of application to study. Nobody denies these facts, but what damage must follow if the functions of the nervous system, the digestive system, the reproductive system, are cut down in this manner.

The great stress of school life under the present competitive ranking system, and with the present disregard of individual endowment, falls upon the brain. The work to be done is not routine. It is always new and unfamiliar. The five or eight hours of work on continuously new subjects represents a continuous mental effort, such as no vocation of after life calls for. It is to be remembered that these tasks are laid upon immatured organs. The organization of the brain is not mature till many years after that of all the other organs of the body. Our school curriculum reverses the natural order of evolution and applies a forcing system not to the body, but to the brain. Whereas it is a physiological law that an immature function should be used very sparingly, the requirements of the school curriculum put a constant strain upon such immature functions. The life of the child of the present generation is one of ceaseless mental activity in sharp contrast to the life of physical activity of the youth of earlier generations.

Only the natural abounding vigor of youth prevents the reality of this strain from being patent to every one. With any careful investigation it may be readily found. The immediate results of this over-stimulation of the brain are certain school diseases, as Virchów, of Germany, years ago termed them, among which are St. Vitus' dance or chorea, epilepsy, hysteria, etc. In one form or another these diseases are exceedingly common among school children. Thus Hamilton found 20 per cent. of New York

school children choreic, or affected with similar disorders. But more important are the remote results in the various breakdowns of later life. A healthy young man may smoke cigarettes immoderately year after year with no ill effects visible to himself or his friends. But ten or fifteen years later he is turned down by the life insurance examiner for a tobacco heart and other troubles. The analogy holds in the relation of school fatigue to the nervous and mental breakdowns of later life. There is certainly significance in the fact that neurasthenia, or nervous prostration, was first described to the medical profession only thirty-five years ago by Dr. Beard, of New York, in the fact that it has become one of the predominant diseases in all civilized communities, in the fact that both in Great Britain and in this country insanity has increased over 50 per cent. since 1860, in the fact that in our mortuary statistics the number of deaths from nervous diseases stands at the head of the list. There is good reason to affirm that the present educational theories and methods have a direct causal relation to the highly nervous temperament of the American people, and the development on an immense scale of neurotic ailments.

A young man of thirty, highly neurasthenic, and in a poorly paid position, recently introduced himself to me, saying: "I am one of that class of men who always stood first in school, but were never heard from afterwards." The fact that so many high-stand men break down is the best possible witness to the severity of the tasks imposed, and to the intensity of the strain upon those who strive completely to master them. Our greatest inventors, like Fulton and Edison; our greatest organizers of industry, like Vanderbilt and Carnegie; our greatest political leaders, like Washington and Lincoln, were men whose early education was truly and fortunately neglected. Our college men are a picked crowd, but they have not developed men in that class. Indeed, there is good reason to believe that our present educational curriculum, including that of the college, when it does not induce actual breakdown nevertheless frequently, as in the illustration of the eye, materially reduces the native energy, originality, and power of initiative of the mind, not only through the vain attempt to assimilate such immense quantities of mental food, but also through the long continued submission to authority in every line of work.

In the next place the present school curriculum, by enforcing a sedentary life upon children, necessitates a poor physical development. Mosso has demonstrated by means of the plethysmograph that in a healthy man whose arm is fixed in the apparatus and who engages himself in some intellectual effort, the arm shows a distinct diminution in size. The reason is that the blood vessels

of the limbs become slightly contracted, while those of the brain become dilated. This gives us an idea how not merely from non-use, but from subnormal blood supply, the muscular system, and undoubtedly, to an equal extent, other systems of the body suffer in development. Physical weakness is the inevitable result of the constant mental stimulation of our prolonged and competitive courses of study. We must remember that more than half the population of our country live in cities, and for the older parts more than two-thirds. The city boys are cut off from both athletic sports and out-door work. They have no adequate play room. Golf, tennis, hunting, fishing, are not for the masses. The city boy belonging to the average family has not been developing the bodily health and vigor which the boys of past generations have had. One striking proof of this fact has recently come to view. Thus the recruiting officers of Chicago have found that while the passage average of the country boy in relation to the required physical tests is one in two, that of the city boy is only one in five. In the Boer war the proportion of rejections for physical disabilities was eight out of eleven, far greater than ever before. Nine-tenths of our school boys are too physically weak for athletics.

The injurious effects of present educational methods upon the physical development of girls are even greater and more important. All writers on diseases of women unite in declaring that the prolonged and laborious efforts of thought and memory create great feebleness of the muscular system and a marked tendency to weakness of the generative organs. Men like Thomas, of New York; Fothergill, of London; and Cameron, of McGill University, affirm that the lack of muscular development and the sedentary posture of the scholar are responsible for pelvic asymmetry and contraction and thus for the difficult and increasingly instrumental childbirth of recent years. But beyond all this very few women who go through our school curriculum are physically able to care for their children after they are born. It needs great reserves of nervous and physical energy to take care of a young child in the first years of life. The women of the present day education who can do this as it was done by the women of former generations are certainly few in number.

The relation of the greatly prolonged school curriculum to the extraordinary change of the birth rate among the American people in the past seventy-five years must not be overlooked. In the first two hundred years of our existence the population doubled itself every thirty-six years, the birth rate being the highest ever known and furnishing Malthus the basis for his gloomy theories. At present, in Connecticut, for example, the birth rate represents a gain of 1 per cent., requiring, therefore, a hundred years for a doubling of the population. This gain of 1 per

cent. is only due to the foreign element which, although numbering only one-fourth of the total population, furnishes two-thirds of the total number of births. In point of fact, the native population is rapidly dying out, there being nearly two thousand more deaths than births annually among them. A leading Catholic bishop has truly said recently that more than one-half the children born in the State were baptized into the Catholic church. An examination of the census for the past two or three decades shows that what is true for Connecticut is true to a large extent for the entire country. It is interesting to compare the birth rates of some of the principal countries of the world. For Hungary and Eastern Europe it is forty-seven per thousand; for Germany, thirty-eight per thousand; for England, thirty-one; for France, twenty-three; for Connecticut, twenty-three; for Litchfield county, eighteen. The most threatening factor in the outlook for America is the low birth rate in the native Anglo-Saxon stock. If present conditions continue we will certainly soon be classed with the decadent races.

The immensely advanced standard of our educational system is certainly responsible in large measure for: First, a greatly advanced marriage age; second, a diminished marriage rate; third, for a discouraging physical inability to care for children. There is likewise good reason to believe that it is responsible for an actually existing sterility due to weakened reproductive functions.

In the third place, physicians have emphasized the bad effects which the indoor life of present educational methods is certain to bring about through a poisoned atmosphere. Whoever understands the open air treatment of consumption must be aware of the difference in the nutritive value between the outdoor and the indoor air. Rebreathed air is the main cause favoring consumption. In spite of the best possible modern arrangements for ventilation, which, however, obtain actually in but a very few schools, the air in our overcrowded recitation rooms must be poisonous in a high degree. The inevitable results are loss of appetite, lowered vitality, anæmia, malnutrition. This, with the foregoing causes, contributes largely to the many functional troubles and the invalidism prevalent among Americans. It is idle to appeal in contravention to the diminished death rate and the increased average of age per generation as signs of improved physical conditions. Invalidism does not prevent longevity, which is an individual inheritance. The diminished death rate and greater average of age per generation simply mean that the germ diseases which used to cause such frightful mortality, especially among the young, are disappearing before modern sanitation or being successfully fought by modern methods. The great prevalence of this invalidism, however, is evident in the

immense number of sanitariums which have sprung up in the past thirty years, in the vast consumption of patent medicines and specifics of every kind, in the extraordinary increase in the number of physicians in particular, in the appearance of the specialist in great numbers, who treat exclusively local diseases, which is usually but another name for invalidism, in the appearance of faith curers, osteopaths and itinerant quacks in shoals.

In spite of our wonderful progress in sanitation, in the banishment of epidemics, in our better food, better housing, greater knowledge of the laws of health, there are more invalids than ever before. There is less resistance to such germ diseases as grip, pneumonia, cancer, appendicitis. It is impossible to look through the ranks of society from top to bottom without perceiving that an immense proportion of men and women exhibit the physical delicacy, the pallor, the depression and the restlessness which do not belong to sound, healthy stock. We attribute these conditions in a general way to the pressure of modern life, but to specify in particular, can any cause for these conditions be found which is in any degree equal to the change to the indoor, sedentary, intellectual existence as required by present educational methods throughout the years of growth and development?

An underlying cause of all these conditions is undoubtedly social ambition. The unrestricted opportunity to rise in the world, to become a power, to be distinguished for learning, wealth or position is the stimulus to individual and to family alike. If the parents have had ill luck, the ambition is concentrated upon the son or child. The single child or two in each family are the objects of a stimulating attention and urging unknown in the days of large families. Children to thrive physically must not have too solicitous attention.

If the foregoing allegations of physicians are true or in any considerable degree true, it is evident that there is an urgent need of a change in our educational program. Modern civilization cannot be changed. City life cannot be changed, social ambition can at best be but slightly modified. The place where change is possible and is most clearly needed is in our educational system. The theory of education must be broadened to include the whole man—body as well as mind. The aim of the State from the time it begins to appropriate the time of the child should be to make the child the most effective possible member of society. Unquestionably, the welfare of the individual, the welfare of the State and the welfare of the race are identical. But for racial or evolutionary ends, the single important fact concerning the individual is that he shall become the healthy parent of healthy children. A healthy, vigorous physical development, then, ought to be recognized as the fundamental right of the individual and

the fundamental duty of all in charge of the development of the individual. As has been shown, the opportunities furnished by nature to secure this physical vigor have been cut off in a large measure by city life and by school life. A modification of school methods is urgently needed to secure the important ends in view.

The school curriculum can certainly be greatly simplified and abridged with benefit to the pupils. It is better to know a few things well than to have a smattering of many things. The essential points of United States history, for example, can be given in a book of one hundred and fifty pages as well as in a book of three hundred pages. The same thing is true of all text-books. For the average boy and girl not contemplating a professional career, the thorough mastery of the so-called school arts—reading, writing and reckoning—is all that is necessary to enable them to meet the demands of after life. It is a great mistake to keep the young man so long from the active work of life. We must not forget the tremendous educating agencies at work on every man, woman and child, from cradle to grave, which have come into existence in the past sixty years with the elaboration of the steam printing press. No one in civilized communities can escape these educating agencies. The situation has indeed utterly changed. The atmosphere of modern life is highly intellectual, and there is an incessant bombardment of the mind with new ideas on all subjects. If the mind is not worn or jaded by early overstrain no one can fail to be indeed well educated. The intellectual strain of later life is so constant and so great that the child should be kept away from it as long as possible. The child then should not learn to read too early. His love of myths and fairy tales should not be indulged to the extent of curtailing his love for boisterous play. Rather every opportunity should be taken advantage of to encourage the psysical sports and recreations. In later years, likewise, the need, the time and the opportunity for play or sports should still be recognized and provided for.

As we have said, the theory of education must be broadened to include physical as well as mental training. Physical training has for its object the symmetrical development and strengthening of the body as a whole. It takes cognizance of the condition of every part of the muscle power, of the chest expansion, of nerve control, of organic weaknesses and needs.

Physical training, as I use the term, has as broad a meaning as mental training. It includes not only gymnastics, but also such accomplishments as the manual of arms, fencing, wrestling, dancing, such employments as are to be found in the garden schools of Sweden, or the farm schools of our own country, and likewise the industrial employments already added to our cur-

riculum which, however, should not be an addition to, but a substitute for purely mental work. The most pressing need of the day is that the mental training be cut down and that time be thus gained to the extent of one-quarter or one-third daily for various forms of physical training. While a graduate in physical training should be at the head of this work in every large institution, every teacher should know something of it and be able to carry it out. I think it may be fairly urged that under the conditions of modern life there is as much need of physical training of the young as of mental training, that physical training is as impossible of accomplishment by parents as mental training, that physical training is the most clearly indicated way to secure good health, and that it will add much more to the happiness and effectiveness of the individual than the amount of mental training necessarily displaced by it.

Dr. Truslow said that the number of children who come for treatment of deformities in dispensaries shows that more time for physical training should be given in public schools.

Dr. Sargent, of Harvard, said that we should work through the parents to influence school boards to give more time for physical training. The fact that physicians who are disinterested show an interest in this is evidence of the importance and value of it. Schools where one-half the time is given to exercise get as good results as those which ignore it.

Dr. Barrett said that he advised parents to send children for a special course in gymnastics, to his personal loss, because of the value of it to the child.

Mr. Thompson, of Carlisle Indian School, said that for at least twenty years the half-day physical work and half-day mental work has been in operation and they secured equally good results mentally and better results physically.

Dr. Brown, of Barnard School, said that we cannot do much to improve matters so long as the mental requirements for entrance to college are so great that no time is left for physical training.

Mr. Rexford, of Montreal High School, said that difficulties in getting sufficient physical training are due fully as much to changed conditions in home life as to changes in school life. The changes in home and social life call for much more time and distractions, and these interfere with school life and physical training.

Dr. Simpson closed the discussion by saying that stimulation on the part of parents for study and maintaining high standards are the main difficulties in securing sufficient physical training for children.

EFFECT OF ATHLETICS UPON GROWING BOYS.

BY DR. WATSON L. SAVAGE,
Columbia University.

MR. CHAIRMAN, LADIES AND GENTLEMEN:

In offering this subject for your consideration I present a problem suggested by the examination of boys entering the freshman class of Columbia University, and one that must come before secondary schools for solution. That we may understand clearly its scope, it is necessary first to define and classify athletics. The word is here used to include all forms of competitive games, sports and contests requiring exertion, in which the boys of our secondary schools participate, be it a game of golf on the one hand or an eight-oared boat race on the other. But as it will be impossible in the limited time allowed for this paper to take up each game and analyze it, I have classified them and shall use one as a type of its class. These may be classified under three heads: 1. Individual Antagonistic. 2. Team Contests. 3. Racing.

The first division includes such games as are participated in by two or more men, each one depending upon his own individual effort and that of short duration—as golf, boxing, fencing, wrestling, handball, tennis, jumping, vaulting, shot-putting, hammer-throwing, discus-throwing, gymnastics, etc. This first group may be subdivided, according to the character of the sport, as follows: (a) golf, tennis, handball, squash, racquets, all of them light action movements attacking alternately a ball; (b) fencing, boxing, wrestling, sports of direct personal contact; (c) shot-putting, hammer-throwing, high and broad jumping, discus-throwing, pole-vaulting, heavy gymnastics, etc., all requiring extreme effort of short duration.

In the second group, team contests, a given number of men contend against an equal number, each playing or having a distinct part to perform. The subdivisions are two: (a) cricket and baseball, where one team rests and the other performs the bulk of the work, while the plays require skill rather than strain, and the duration of effort is short; (b) basketball, lacrosse, the various polos, hockey, football, etc., where both teams play at the same time for a given period.

The third and last large group, racing, comprises: (a) rowing, running, swimming, bicycling, etc., where the single individual is competing against one or more, doing the same act continuously for a given distance or length of time; (b) contests in which all the players on each side are performing

the same thing at the same time, such as tug-of-war and crew rowing, the strain being continuous for the full period of the contest.

Division (a) of the first group—golf, squash, tennis, handball, etc.—is classified according to strain upon the heart. Golf would hardly be considered a game of sufficient activity for healthy boys bubbling over with youthful vigor; yet it has excellent qualities, recommending it to all ages, both sexes, and all degrees of physical condition, and better for approaching second childhood than in leaving the first. Squash ball is a cross between tennis and handball, quite new in this country and little known. Tennis develops quickness of action and thought and a high degree of co-ordination. Its strain upon the heart is limited, owing to the nature of the game, for it has frequent intervals of rest, but it has also the disadvantage of being a one-handed sport. I shall therefore take handball as the best type of this group, and the most severe, requiring as it does the use of both hands, right or left, as the occasion arises. The ball is in play continuously, but must be reached and played with hands, requiring bending forward, back, and to the sides, and thereby bringing into play the waist, trunk, back and legs. It therefore cultivates quickness of action, mental acumen to the highest degree, judgment of distance, direction, angle, use of force instantly, while the ground must be covered at the same time; decision must be made as to where the ball shall be returned out of reach of the opponent, and a more or less severe strain put upon the heart regulated largely by the skill of the player and his opponent. It should therefore be classed as a vigorous, valuable game for boys, developing quickness of mind and body, judgment of force, angles, distance, reaction, etc., perfect coordination without an undue amount of danger from overstrain, since it is always within the power of the player to limit his action; an excellent game to train for most any other form of contest, especially ball games.

As a type of subdivision (b) of this same first group—contests in which two men oppose each other—I should select the sport of boxing. This is a light, active exercise, which may be taken in moderation and brings the entire body into activity, the legs being quite as useful as the arms and hands. There is necessity to keep the body on a firm foundation and at the same time to move quickly in varying directions. During the bout, which is usually limited to periods of short duration, according to the strength of the individual, the muscles of the legs are kept at high tension. The arms are in constant motion and also at high tension in readiness to act in an instant. The muscles of the neck, as well as the back and dorsal muscles, are brought into con-

stant action. The entire muscular system is under tension at all times. The brain is kept very sharply awake studying the opponent, anticipating his movements, and endeavoring to find an opening for attack or repulsion. The brain becomes very active and there is a nervous strain as well. The activity, excitement, and continuous tension make a demand upon heart and lungs which easily becomes very severe. But this is at times within the power of the individual to fall back upon the defensive, and thus relieve the pressure if it becomes too great, and gives time to adjust and not to force to a limit, or even to withdraw for a few moments at any stage of the game. The strain upon the organs, however, is so severe that the contest should always be under the control of a master who can observe the condition of the boys and limit the duration of the bouts.

Some have objected to boxing on the ground that it makes the lad pugnacious and quarrelsome, and inclined to seek fight and arouse trouble. Yet the fact of the case is quite the contrary. A thorough knowledge and the practice necessary to obtain this knowledge will develop the very elements to keep out of trouble with dignity and self-possession, the exercise requiring chiefly quick thought and action. Whatever else he will learn, the boxer will find that to lose his head is to lose everything, and this lesson has accordingly a most beneficial effect on the hot-headed. It is practically thumping into the lad's head the necessity of the control of his temper. Again, the slow, heavy, sluggish boy will learn one of the best of lessons from this exercise, for it will waken him and arouse in him an interest for his work. Most other forms of exercise may be taken in a listless way, but here is one that gives the teacher opportunity to overcome listlessness without incurring criticism for corporal punishment. Further, as your hands are always with you, you have a ready weapon, if made effective with training, for self-preservation and protection in time of need. To sum up, we see that boxing develops quickness of eye, thought and action, self-possession, confidence and courage, a high degree of coordination, balance; is a delightful exercise, full of interest and skill, requiring the use of both hands freely; develops the heart; expands the lungs; improves the carriage; opens the pores of the skin; and, in short, is a most valuable exercise. Under proper regulation it may be considered one of the best general exercises in physical training for schools. It is excellent to prepare men for teams, and might well be made a part of the early training preparatory to such teams. It should not be made merely a small part of the day's order, but, in that event, should always be limited and kept well in control by the master in charge.

Fencing has many of the elements of boxing. It develops

quickness of eye, coordination of the entire body, but is not quite as severe upon the heart. It does not develop courage, as the element of danger is eliminated by protection, is one-sided, and, in this country, has no practical value. The sport is more suited for girls than boys, and there is some danger of inducing curvature of the spine during the growing period, unless sufficient forms of other exercise are given to offset the result of this one-sided work.

Wrestling should be postponed in a boy's training until the growth has been attained, and the bones have become well ossified and the muscular development well advanced. The danger of injury to the body in this sport is greater than the gain in compensation, and the continued strain put upon the whole system at one time, where the chest wall is contracted, muscles set, breath held, and every force exerted, brings a strain upon the heart that seems to me dangerous.

The sports of division (c) of the first group—shot-put, discus-throwing, hammer-throwing, high and broad jumping, and heavy gymnastics—require extreme effort for their successful performance, a long and thorough course of preparation and training, which from the very nature of the case must be progressive. There is no special effort of the brain, the strain upon the heart is limited to a single effort of short duration, followed by a long period of rest and relaxation. While fully aware that the breath is held during an extreme effort, I see no reason why these sports should not become a part of the athletic training of our growing boys. Gymnastics would be considered the best type of these for school boys, as they can be perfectly regulated and require a small amount of mental application, at the same time keeping the organs of the body in a healthier state. I do not care to open up the old question of gymnastics versus athletics at this time, so passing to section a of the second large group—cricket and baseball—I should place preference, on the basis of physical strain upon the boy, to the former. Cricket, unfortunately, is little played in this country, baseball being the American game. Both sports require much practice, great skill, judgment of distance, speed, force, calculation, study of position, direction, movement, quickness of action and perfection of coordination, in short, games of a very high educational value, requiring sudden physical exertion of short duration, yet not too highly educational as sometimes argued, for the boy does not know how to use his brain in the game except as he develops and strengthens mentally, while at the same time the danger of over-exertion physically is small.

In the class of sports (2-b) comprising lacrosse, the various polos, hockey, basketball, football, etc., both teams are in equal activity

during the entire period of play, which is regulated by a length of time rather than by the exertion required in a number of skillful acts. They require for successful operation continued activity of all participants in the game, broken only by periods of suspension due to conditions and rules of the game. There are, however, in these sports, other intervals for the various members of the teams to get moments of rest and relaxation. Short periods of rest for the player to recover his "wind," as the expression is, allow opportunity for the heart to adjust itself and the lungs to get rid of the waste products of exertion. In these games, above all others, the necessity of harmony and co-operation among the players is absolute; the boy must lose his identity and must become a part of one great whole. He must obey implicitly the orders of his captain, and at the same time be alert to carry out his part of the game successfully and vigorously. He needs to be ready to change, on the instant, from attack to defence; he must keep the field of operation constantly in mind, taking advantage of every opening, fill every gap, putting his whole heart and soul into the game. He must be aggressive, fearless and energetic in attacking his adversary, and ready to sacrifice himself at the altar of duty by springing into such a position as to receive the attack and thereby protect his comrades. Such sports bring out every ounce of latent energy there is in a lad. The greater the element of danger in a game the more forcibly does it operate to develop these characteristics, so that we would place football highest in the category of these sports, and I believe that the occasional injury to the individual is a necessary sacrifice for the good of the many. Notwithstanding the fact that in every season a number of boys are more or less severely injured, seeming in the aggregate very large, yet from consideration of the number playing football during the season, this is comparatively small. To offset this damage, we have, I believe, the best game to bring out the strong and vigorous qualities that make men of boys. The strain upon the heart is relieved and lessened by the intervals and breaks in the game caused by the various rulings and regulations governing the same. The benefits to be gained by these forms of sports, therefore, must be self-confidence, obedience to commands, courage, aggressiveness, determination, alertness, quickened coordination, speed in decision and action, strength of body and generalship. What qualities would be more desirable or valuable to a young man in fighting the battles of life?

We now arrive at the third and last group, which includes (a) racing in general, such as foot races, skating, swimming, and bicycling; (b) tug of war, rowing, etc. In all these events the strain is continuous from the beginning of the race to the

end. The large muscles of the body which make the greatest demand upon the heart are under severe strain from the firing of the pistol to the finish, and the plucky lad, full of courage and spirit, will not stop until the goal is reached, no matter how great is nature's outcry. One of the most unfortunate conditions of these contests is that skill which requires much preliminary practice plays very little part; the boy, therefore, does not prepare for the worst before he must tax himself to the limit. In other words, he does not give his heart a chance to become strong enough to fulfill the demands made so severely upon it. One such race is liable to cripple the heart of the rapidly growing boy, and to such an extent as to injure him for life. And what is there to offset this condition? What compensation has he for the risk he takes?

This last and most injurious group (3-b) covers contests that require a number of boys to perform the same act for a continuous period, such as tug of war, crew rowing, etc. This adds another element of danger over those in the previous group from the fact that every one on the team is controlled by the strongest of them all, and is compelled to continue to the very end of the race. While it may be entirely safe for a well trained, vigorous lot of young men who have completed their growth to compete in such events, it is wholly wrong for growing boys to be allowed to put such a tremendous strain upon the heart as is involved in such a contest. There is no room for question that extreme physical labor is accountable for many heart lesions, and many a lad is handicapped for life by severe physical strain put upon him during the period of development. How many this number is we do not know at present. It is a well-known physical fact, however, that heart lesions are far more common among men than among women, and the explanation is made that man's occupation calls forth greater physical exertion than that of women, and, continuing the point of comparison, boys' sports are of a severer physical nature than those of girls. In our examination of young men on entering college, we find cases where the heart's action has been uncertain, irritable, irregular, rapid and excitable, with faint lesions and murmurs of the mitral valve, for which we could find no cause, reason or history except early-followed and excessive athletics, and usually those of the group last mentioned. I believe the danger to be principally during the period of life from twelve to sixteen, or the period of rapid growth.

The argument may be offered that it is inconsistent to permit boys to play football when the injury resulting is sometimes serious and apparently more frequent of occurrence than in racing. To this I shall reply that the benefits gained in the one game

more or less justify the risks taken, while in racing there is little to say that is favorable. What can be the educational value in a distance foot race to the boy, say, of 14 years, since it is merely a case of physical strain without due compensation?

The argument of the greater damage in the one sport is not verified by facts. Consider that the number who participate in football is far greater than of those who engage in this class of racing. In addition, the injury received in football is evident on the surface, for it is external and readily diagnosed, and may be directly charged to the sport. Such injuries are usually of a temporary character and are not detrimental to the boy's usefulness in after life, while the exact reverse is true in the case of an overstrained heart. I claim that the real and permanent danger is more frequent and more serious, and the compensation at least questionablle in the latter sport.

That early racing makes a more competent athlete later in life I am convinced is false from the records of intercollegiate champions. It is an exceptional case where a boy who was a champion junior in his school becomes both a scholastic champion and an intercollegiate champion in middle and long distance events. The occasional instance of this kind has usually been a boy older than the average school lad, whose utmost effort had accomplished this feat after the period of growth and when he had become mature and settled. Rather how many cases do we observe from our scholastic records of young men who gave great promise when put into college contests yet failed to fulfill expectations! And why does this happen so often? The usual explanation offered is that the boy is in superior company and thereby outclassed.. My own belief is that he is outclassed, not always because he did not originally possess the qualities of a champion, but that he was allowed to exert himself beyond his capacity during his younger days, thereby aborting his capabilities.

During the years of rapid growth, the system under natural conditions has much more labor put upon it than at any other time in life, and, unfortunately, it is also the period when the mental strain due to our present educational arrangements is far too great. Let *us*, then, whose duty it is to safeguard the health of the student, refrain from permitting a third baleful influence by allowing over-exertion in physical effort. From this standpoint, I deem that the physical director of the secondary school has the greatest responsibility and the most delicate duty to perform, and should correspondingly be the best qualified.

I would particularly recommend and cannot too strongly urge the careful examination of the heart both before and after exertion, and the recording in each case of the branch of sport in

which the youth participates. In following out this plan, it would be most interesting to note the length of time the heart takes in every case of athletic effort to recover its normal rate. To be sure, this would be but one guide, but *that one* not requiring a foreknowledge of medicine. Under these precautions, I would recommend the games of group 1, a, b, and c, with the exception of wrestling, and classes a and b of the second group, since these create (1) a healthy spirit of rivalry in schools, (2) are valuable factors in education, (3) they tend to improve the health with the minimum danger of serious injury. Lastly, I would recommend that all games requiring a continuous severe strain upon the heart of more than thirty seconds, such as running, swimming, rowing, skating, cycling, tug of war, be eliminated from the sports in our secondary schools, because:

1. They are entirely unnecessary to the school.
2. Because they have little or no educational value to the student.
3. Because they may abort the future capabilities of the lad in athletics.
4. Because they endanger the health and future life of the boy.

Dr. Bolin, of New York, said that athletic contests must be vigorously controlled.

Dr. Meylan, of Boston, emphasized the dangers of excessive athletic competition for growing boys, which are shown by the fact that boys who attain great prominence in interscholastic athletics never attain prominence in college athletics because they were permanently injured in school athletics.

Dr. Truslow spoke in favor of the relay race as being a good form of athletic competition for boys.

Mr. Thompson, of Carlisle Indian School, said that the criticism of brutality in football is due to the too intense desire on the part of team managers to put brutes on the team in order to win.

Dr. C. W. Crampton, of New York, read a paper on the "Function of Physical Training in High Schools."

There was no discussion.

THE VALUE OF ATHLETICS TO COLLEGE GIRLS.

BY MISS HARRIET I. BALLINTINE,

Vassar College.

In the physical training of girls, and especially with older college students, it is most important to arouse in them an interest in their work. While recognizing that individual exercise is absolutely necessary to bring about certain results, and that nothing can take the place of prescribed individual work in correcting physical defects, we must do more than this if physical training is to have its proper place in the college. It is necessary to secure the interest of the student if we wish to inculcate fixed habits of exercise and train girls to look upon their physical work as a matter of course. The therapeutic value of exercise does not appeal to the majority of college students, already overburdened with duties. They demand, and need, recreation and relaxation, and, if the work offered does not meet these requirements, it will fail in its purpose.

In the training of college girls we must satisfy, as far as is consistent with the ability of the individual, the demand for interesting work. We must first endeavor to arouse the interest of the girl; and after that is accomplished, it ought not to be difficult to turn her attention to her individual development, if necessary.

What, then, are the forms of exercise best adapted for this purpose?

Basketball has already an established place in the majority of girls' schools and colleges, and has done more perhaps than any one game in arousing an interest in out-of-door work among girls. But in a college with hundreds of students, basketball does not fulfill all the requirements. We must have more than one form of sport in order to benefit and interest all. Unfortunately, unless our students play well enough to gain a position on the regular team, they are apt to lose interest and will not practise simply for the sake of the exercise, if there is no prospect of competing in the match games.

In every college there are certain conditions relative to the work of physical training that must be met by only that college. The line of work laid down in one place cannot always be carried out in another. The demands of the place and time must be met. Shortly after the introduction of basketball at Vassar College the students asked permission to institute track and field athletics. It may be of interest to give a short resumé of our athletic sports and to show what is being done in this line of work at present. Athletics were introduced with some reluc-

tance, it is admitted, because of the demand. It was an experiment and so far has been most satisfactory.

Training for these events has added greatly to the interest in all out-of-door sports. The attitude toward the whole question of physical training has changed in a marked degree since the introduction of our field day. The sports have been running, hurdling, the fence vault, broad and high jump, throwing the basketball and putting the shot. The shot is only eight pounds, and those who enter for this event are the stronger girls. The students in training practise regularly at least three hours each week and sometimes more, for from four to five weeks, and out-of-doors whenever the weather permits. All required work in the gymnasium is over the last of March, and the out-of-door work is optional. There is no forcing of the students to induce them to take up this kind of exercise, but it is left entirely to their inclination.

Last year over eighty students took the out-of-door training, while only thirty cared to enter the field day. There must be something in active sport of this kind that meets a want, when girls will train systematically for several weeks simply for the pleasure they find in it. The out-of-door practice is under the direction of the gymnasium director and the assistants in the department; but the students have the management of the field day in their hands and they have instituted the rules governing those in training.

Regulations in regard to diet and sleep are strictly followed. Confectionery, afternoon teas and all eating between meals are prohibited, and for several weeks those entering either for the sports on the field day or training only lead a most hygienic life. The good results from this alone are not to be underestimated.

Since the introduction of athletics the interest among our girls in their physical development has been greatly stimulated. If a girl finds that another excels her in some favorite event, because of greater strength and endurance, she has been known to devote hours to her formerly slighted prescription work. At the present time and during the past winter there has been a greater interest in the coming field day than ever before, and there has never been a year when the developing appliances in the gymnasium have been so popular.

Thus far only the advantages of active and vigorous sports have been considered. What are the objections to girls engaging in athletics? The question will at once arise, Are they strong enough and can such a line of work be of benefit to them physically? In taking up the question of athletics for women, only those in a normal physical condition are to be considered. Girls

who are physically weak in any way, or those for whom the excitement of competitive sports would be detrimental, should be prohibited from taking part in this branch of physical training. Fortunately, there are hundreds of girls in our colleges who are well and strong, whose vigorous and normal conditions demand a certain amount of healthful excitement and really *hard* physical work. These students will not be satisfied, either mentally or physically, for any length of time, with the milder forms of gymnastics.

Is there not danger of forgetting that we have this class of students to train, as well as the weaker ones? The opinions of some physicians and teachers, especially those engaged in the practice of corrective gymnastics, cannot help but be somewhat biased by the abnormal conditions with which they come in contact.

The ability and needs of the healthy girl should not be determined by that of the neurotic or orthopedic subject, who requires the advice and treatment of the specialist. In all cases the physical condition of the individual should be determined, the exercise prescribed. The question of athletics for girls should be carefully considered and, where introduced, the work should have the most constant supervision. In colleges for women, where there is always more or less control over the students, it ought not to be a difficult matter to regulate the management of athletics and eliminate the objectionable features. If women are to enter into athletics it should be for the purpose of recreation and maintaining health. The making of records, while of some interest to the competitor, should be only secondary in importance. Those who advocate a more radical form of physical training for women realize that there is a growing demand for it among the stronger class of college students, and that it is necessary to meet this demand. If the standard of health is to be raised, it is of importance to gain the co-operation of the students by giving them work that will act as an incentive to induce them to practise habitually active, out-of-door exercise.

Miss Morgan, of Wellesley, spoke of the value of physical training for college girls.

Miss Skeele, of North Adams, said that high school girls played the game of basketball with boys' rules; but she advised modifying the rules.

Mrs. Lawrence, of Teachers' College, spoke in favor of basketball.

Miss Avery, of Providence, R. I., also spoke in favor of basketball for girls.

GEO. L. MEYLAN, M.D., Secretary.

SECTION ON ELEMENTARY SCHOOLS.

Miss Jessie H. Bancroft, Chairman, Director of Physical Training, Public School, Borough of Brooklyn, New York City.

The meeting was opened at three o'clock by the Chairman, Miss Jessie H. Bancroft, who introduced Dr. Edward R. Shaw, Dean of the School of Pedagogy, New York City. Dr. Shaw talked upon "Some Results of the Study of Hygienic School Desks and Chairs," illustrating the talk with the Chandler adjustable seat and desk, upon which he had made a number of improvements.

SOME RESULTS OF THE STUDY OF HYGIENIC SCHOOL DESKS AND CHAIRS.

BY EDWARD R. SHAW.

In the spring of 1895, when this Association held its annual session at Teachers' College in this city, I had the honor to read a paper on "Vertical Script and Proper Desks as Related to Education," and in illustration of some points made in the paper to exhibit to the Association a chair and a desk, the latter having a slope of 15° for writing and also having the desk top adjustable for a minus distance of 3½ inches and a plus distance of 1½ inches. A trial of this desk in actual school-room use for two years or more revealed certain defects, which had to be regarded in no other light than as drawbacks. In the first place the shape of the desk was such that not sufficient room was afforded for the books and materials ordinarily used by pupils at school. In the second place, as the sliding top, by the very construction of the desk, always remained at an angle of 15°, materials employed in various activities as in science work, nature study, certain minor forms of manual construction, and also papers would either slide off the desk, or special care had to be given to them to prevent their rolling or sliding off. The merits of having the top of the desk adjustable for so great a minus distance combined with a slope of 15° for writing, ciphering, or drawing were so marked that I set about the production of a new desk box which should retain the merits and overcome the defects of the desk.

The results of my effort in that direction I have the honor of submitting to this Association to-day. The desk and chair now

before you have been tested for four years in actual schoolroom use. During that time I have made improvements on it, but these were not improvements in principles involved but merely for the purpose of rendering noiseless the movement of the lid forward and back. In the first form of this desk the lid slid backward and forward by means of an iron projection catching under a flat rod of iron. In the present form, the iron projection catches in a groove cut in the side of the desk, so that instead of iron rubbing on iron, we have a piece of iron moving in a wooden groove.

The desk has been named the Heusinger Desk because the experimentation of which it is the outcome was conducted in a school of that name in this city, the school having borne the expense of the various trials.

Courtesy of the Macmillan Company, New York. From Shaw's "School Hygiene."

Fig. 1.

The Heusinger chair and desk, as all here will recognize, is the Chandler adjustable chair and adjustable desk standards to which is attached a box desk having a slope to the top of 15°, that recommended by the Vienna School Desk Commission. The lid of this desk box separates from the flat part of the top just back of the hinges and may therefore be drawn down to a minus distance of three inches. The desk is set at a plus distance of one inch which affords the pupil greater ease and freedom in taking his seat and rising from it, yet the lid, under the above conditions, may be drawn down to a minus distance of three inches.

Courtesy of the Macmillan Company, New York. From Shaw's "School Hygiene."

Fig. 2.

The desk when set as this model which has been brought here from the school room shows, is therefore adjustable for plus and minus distances, as shown in Figs. 1 and 2.

Two short wooden standards are placed inside the desk box, as shown in Fig. 3. By raising these and letting the desk lid

Courtesy of the Macmillan Company, New York. From Shaw's "School Hygiene."

Fig. 3.

rest upon them, the top of the desk is made to assume a slope of 5°, useful in certain kinds of work in science, in nature study, or manual construction which the pupil is often asked to perform at his desk.

In our trial of this desk for four years, we have found that the pupil can sit at this desk when adjusted in the three ways it permits, and write, cipher or draw, maintaining meanwhile a correct posture. His shoulders will not be raised, nor will he be obliged to bend forward, and the writing will be at a proper distance from the eye.

Miss Ada Thayer then read a paper written by Dr. Eliza M. Mosher, Dean of the Woman's Department, University of Michigan, upon "The Importance of Hygienic Seats and Desks for School Children." This paper presented the advantages of a desk and chair invented by Dr. Mosher.

Dr. James B. Fitzgerald, Director of Physical Training of the Boston public schools, presented a school chair of which the seat was circular in outline, making practicable the facing of the pupil in various directions while seated. Dr. Fitzgerald also showed a novel placing of the chair in relation to the desk, the former being slightly to the left of the center of the desk. This arrangement was the result of experiments as to the reason for the rotation of the trunk in the writing position. These experiments had led to the conclusion that the rotation resulted from an instinctive effort to get more desk room for the arm active in writing. The placing of the chair slightly to one side of the center of the desk gave this desired room without unduly lessening the space for the left arm.

Dr. Thompson was unable to be present, but sent a sample desk and chair. These were each portable, not being intended for fastening to the floor. Mr. C. S. Alexander, Principal of the Model Schools connected with the Fitchburg Normal School, sent the following notes upon the furniture. These notes, and the furniture, were presented by Miss Ellen LeGarde, Director of Physical Training in the Public Schools of Providence, R. I.

Mr. Alexander wrote:

For our new model and practice school building, in consideration of the best comfort and health of the children, we selected the desk and chair like the sample.

In regard to the chair:

1. We desired a movable chair instead of one screwed to the floor, as we consider the nervous strain on the child is less in the former kind than in a chair they know they cannot move. Think of your own feelings when you get into a chair that cannot be moved. Do you not feel a restraint? The child has five hours of this restraint while you have probably only a few minutes.

2. The movable chair allows all sizes of pupils to regulate at will the distance of the body from the desk, and as we have all heights of these chairs a child can be measured and a chair given suitable to his height.
3. Economy comes into play. Our music teacher gives (about once a week) to each school some part of a musical recital. The children take their chairs and march into the hall where the piano is and can enjoy the music because their seats are comfortable for them.
4. At the close of the session each pupil can put his chair on the top of his desk and the janitor can clean throroughly around his seat. (It is easier for the janitor.)
5. These chairs give the school room more the appearance of a home and at the same time aid in the business side of the school. When we have public day exercises in the Normal Hall (Memorial Day exercises) each child can take his own chair, thus saving the necessity of hiring additional chairs for the public exercises.

These chairs are no more expensive than the ones with iron castings.

In regard to the desk:

1. It is made so that one-half is at an angle of 15° ALL *the time,* for drawing and writing; the other half is flat for use in busy work, holding the materials used for drawing or writing, etc. We have another desk the cover of which can be raised to this angle, but there is no place where you could rest a book or paper used in copying, or the water cup and paint box in painting; also this angle is subject to change by the pupil and you know it is hard for the pupils to change the angle except for the regular writing or drawing lesson, or for the teacher to insist upon their doing so.

   The number of degrees slant may be greater or less, as is thought advisable.
2. These desks have a greater surface than the ordinary desk for the child to use. The irons were bronzed to give a warmer atmosphere to the school. It brightens the room.
3. By placing these desks on shoes, we are able to give a pupil a desk in the second grade and allow him to keep this same desk through to the High School. This enables the pupil to take better care of his desk for he knows he is to have it all the time he is in our school. A pupil's place may be changed in the room and by taking his desk with him the bother of a new adjustment is saved. The keeping of the same desk does away with the chance of contagion.

4. In case of public exercises the desks can be taken out of the room and chairs substituted for visitors, or two or more schools can be united easily.

5. By the use of movable chairs and desks, the janitor can, by moving them to one side, give the floors a good washing at least once a month, or, as in our case, oftener.

6. By the use of this furniture the floors are worn more evenly, for the aisles are frequently changed.

Dr. Thompson was asked if discipline was not difficult in a room furnished with movable furniture, or the noise troublesome.

Many of our schools are under the charge of Normal pupils and we have not observed that the discipline is any harder for them or the noise any greater.

If it is a success with us, it surely would be with teachers of experience. I was skeptical at first in regard to the noise, also the trouble in keeping the rows in line, but I must confess to being happily disapointed and I hope to be able to change over all the old furniture we now have for this new kind.

CHILDREN'S GAMES IN THE ANDOVER PUBLIC SCHOOLS, AS MEANS FOR AVOIDING OVER-PRESSURE.

BY GEORGE E. JOHNSON,

Superintendent of Public Schools, Andover, Mass.

The public schools have by no means reached the safety point in regard to over-pressure. However much we may disagree as to the amount of over-pressure in the public schools, we all agree that there is danger of over-pressure in the case of some children. I assume then that any safeguard which may be employed in our public schools, without detriment to the essential work of the school, is generally conceded as very desirable. And I should like to use the term "over-pressure" to include not only overwork, but also any requirement unsuited to the mental and physical capacity of the child, as too advanced work, too close confinement, bad air, and the like. Whatever in school hinders the best physical and mental development of a child tends to augment over-pressure, and should be taken into account.

Using the word in this broader sense, the responsibility of the school becomes very great and the task very difficult. One can scarcely repress the feeling of pain when he notes carefully the form and condition of each child in any public school room. Somebody somewhere has blundered. I do not say it is the school; ten to one it is the parent. (May it not be society?) But is the school to stop with clearing her own skirts? It is an anomalous position that the State takes in asserting that the child is educated for herself, and then concerning herself only with the intellectual training. If the school is to train children for the State, her business is to see that children, whether they come to her physically well-endowed or not, should become so, as far as possible. It is no justification of the school when she sends out children with pale faces, hollow chests and crooked spines, to say that the children were so when they came to her.

The task of the public school, therefore, is an exceedingly important and difficult one. The modern social conditions, our lack of knowledge of childhood and child development, make the dangers of over-pressure, in this broader sense, considerable. But happily we have one safeguard, we know one thing about children, which we can take advantage of. The happy, active

play of children in fresh air and sunshine tends to insure a normal physical development in children, and to counteract nearly every form of over-pressure. I do not know that anybody denies this.

It is the purpose of this paper to describe simply and briefly some use we have made of children's games and play as a safeguard against over-pressure in Andover. And first I beg permission to speak of some of the work of the Andover Play School as fairly belonging to my subject, since it was work done with public school children, by public school teachers, with the public school plant, and was designed in a measure to demonstrate what might be done under public school conditions.

The younger children were occupied with the free, active outdoor play common to children,—romping, racing, climbing; with toys, balls, blocks; with sandpiles and flower gardening; with weaving mats, baskets, doll hammocks, doll hats, reins for playing horse; and with other constructive work with paper and cardboard. The older children selected their own occupations from the following:

Collections—Minerals, Stamps, Coins. *Cooking, Drawing. Field Work*—Butterflies, Birds, Fishes, Flowers, and Ferns. *Gardening*—Flowers, Vegetables. *Outdoor Games and Plays. Mechanics*—Boats and Boat Sailing, Dam and Water Wheel, Machinery, Steam or Electric Motors. *Dancing* (girls). *Dramatics* (girls). *Music*—Singing, Orchestra, Piano. *Photography. Sloyd*—Basket Weaving, Cardboard and Paper Work (girls, and boys under twelve), Wood Work. *Swimming, Printing* (boys only).

SUMMER SCHOOL FOR BOYS AND GIRLS, 5 TO 14.

What I desire to have noted particularly is the energy and great activity displayed by the boys. It is not the place here to discuss the intellectual and moral benefits of this activity as compared with that of ordinary public school work. It is enough to know that it parallels some of the work common in public schools, and scarcely in an inferior manner. But the great point is that the work invited just the kind of activity generally recognized as of great hygienic value, that it not only was devoid of danger of over-pressure, but tended to relieve over-pressure resulting from other sources.

Now a good deal of this work has been incorporated into the public schools. The school day in Andover is from 9 to 12 in the morning and from 1.30 to 3.30 in the afternoon. An intermission of twenty minutes is required in the morning, and a period of twelve to fifteen minutes for play and gymnastics in the after-

noon. Outdoor exercise in the afternoon is required in the primary schools, and is very general in the grammar schools, under the supervision of the teacher.

With the little folks there is a large element of free play. They romp and race about. They have braided reins in the school at recess on rainy days, and with these they play horse in fair weather outdoors. They have some bushels of blocks of suitable size and similar in form to bricks, with which they make many wonderful structures. They have a great sand pile which is covered, now with Esquimo villages, now with farmhouses, far stretching fields, highways and winding streams.

They have a fence or railing made just to climb and balance upon. There is a movable track upon which to walk or run with no danger of being run over by the cars. A swing hangs from a tree, and a good old see-saw invites them all to that classic sport. Ball, bean-bags, hoops, jump-ropes, and various toys brought by the children themselves complete the list of apparatus.

For the younger children not so much stress is put upon the games as upon free play, but many simple games are played. I have not the time here to discuss the relative value of free play and games for the little folks. I think that teachers often err in thinking that the play of little children ought to take the form of a game in order to be of much value. With the primary children, traditional games, games like tag, drop the handkerchief, cat and mouse, are favorites.

Free play is less common with the grammar school children. There is, however, considerable free use of apparatus like jumping standards, ten-pins, bean-bag board, and ring-toss. More use is made of basketball, as a directed game, perhaps, than of any other one game. Each school has an outdoor court. Many other ball games and running games are freely used.

Not having men teachers in our grammar schools, and our women teachers not having any special preparation, we were doubtful of the success of directed outdoor games of grammar school boys, many of whom are expert players of baseball and football. But the success has been most gratifying, the credit of which is largely due to the excellent special teachers we have had, acknowledgment being especially due Miss Agnes Otis Brigham, a graduate of the Boston Normal School of Gymnastics.

Much good comes also from the undirected play of the morning recess and the play before and after school. One of the most gratifying results of the play in the Andover schools has been the play interest awakened among the grammar school girls. Formerly active outdoor games were seldom played by the girls, but one of the prettiest sights I have seen for a long

time is that presented by our large playground, on a pleasant afternoon after school, dotted here and there with groups of girls as well as groups of boys engaged in some active game. The girls do not remain playing after the teachers have left the building. Nothing objectionable that I have learned has ever occurred. This love of active play does not die out when the girls have left the grammar school. The first class that we graduated from the grammar school under the play system carried fire to the high school and kindled an interest there that has not diminished, organizing without suggestion from the teachers a successful and enthusiastic basketball team, which, accompanied by parents and teachers, this winter, have played out-of-town games. It will be a hopeful day when mothers delight to accompany their boys and girls on such occasions and are desired to do so.

Personally I have always taken pains to encourage the right kind of football and baseball among the school boys. It is possible now and then to get some college fellow, or young physician not yet overburdened with professional duties, to coach boys in their games.

It is not uncommon for boys to refer to me voluntarily matters relative to their own baseball and football teams, more often perhaps to get aid in procuring a ball, but even that kind of confidence is not altogether undesirable. A year ago last fall I found time to engineer a series of games in football between the different schools of the town, and am often consulted in the matter of "getting a game."

LIST OF GAMES.

(Including games played spontaneously.)

Games of Chase—Tag. Drop the handkerchief. Cat and mouse. Hunt and tag. Witch in jar. Grocery store. Lame fox and chickens. Tom Tiddler's ground. Blind man's buff. Birds. Mailman. Hopping bases. Hill Dill. Last couple out. Three deep. Cross tag.

Racing—Potato race. Hoop race. Dashes .Relay race. Jumping seat race.

Hurling and Throwing—Tossing ball. Tossing bean-bag. Dead ball. Tossing bean-bags through hole, into a box, or a circle, or through a hoop. School ball. Dodge ball. Throwing at target. Pass ball. Ring-toss. Tenpins. Egg hat. Balloon ball. Grace hoops.

Contests—Basketball. Baseball. Football. Cricket.

Jumping—Jump rope. High jump. Broad jump. Running jump. Pole jump. Vaulting.

Hunting—Hide in sight. Hunt eraser. I spy. Hare and hounds.

Dual Contests—Push from ring. Hold stick on floor. Twisting sticks. Pulling sticks. Hand wrestle. Elbow wrestle. Wrestling. Rough and tumble. Side hold. Collar and elbow. Back hug. Cock fighting. Rider ball. Boxing. Tug of war. Drawing oven. London Bridge. Battle square. Keep ball. Balloon ball.

Marching and Miscellaneous—Russian file. Going to Jerusalem. Spin the platter. Hopscotch. Follow the leader. Thread the needle.

SCHOOL ROOM GAMES.

Much inquiry is made for games that can be played in limited space. It is really wonderful how much can be done in an ordinary school room. If there is a kindergarten room which is vacant in the afternoon, a fair basement, a school hall, or even large entrance halls, so much the better. The great majority of the games mentioned may be played in the school room. A few made-up or adapted games for the school room should be described for the sake of their suggestiveness. A teacher who knows children's games and who has a bit of ingenuity need never be at a loss as to what to play.

SCHOOL ROOM GAMES.

Contests—Stick on floor. Hand wrestling (either hand). Twisting sticks. Wrestling (only on mats).

Running—Potato raee, individual or by sides. Relay race. Tag (through mark). Hunt and tag.

Ball Games—Balloon ball. Keep ball.

Hurling or Throwing—Bean-bags into circle; or the board or hoop. Pitching rings; very pretty exercise, using arms instead of sticks. Rings may be made easily by children from rattan.

Jumping—Over pointer.

Miscellaneous—Jumping seats. Free play. Rings, balls, floor walls.

As to the general physical effects of these games, doubtless, much important and needed work could be done in classifying games according to their effects on certain parts of the body, record being kept of development somewhat after the systems in vogue in gymnasiums in connection with apparatus work. But even now, we can readily see in what respects in general any particular game would exercise the body. In the free play of little children I think I can recognize every class of movements of the Swedish gymnastics as classified by Professor Theodore Hough in his review of Swedish gymnastics. In the game of ball one readily sees the span bending, heaving, back, abdominal, lateral trunk, extremities, and balance movements, together with vaulting, jumping (of fences), and much running. The simple game of cat and mouse for little children requires all sorts of arm and leg and body flexions. But we need some expert investigation along this line.

The following questions were asked of public school teachers in Andover:

1. Do you approve of an afternoon play? Why?

2. Do you think that the games played in the school room have been of any benefit to the children (a) physically? (b) mentally? (c) morally? If possible, please mention something definite in regard to a, b and c.

3. Please answer the same questions in regard to the outdoor games.

4. Please mention any harm that has resulted from the games.

5. In what ways have play and games affected school work?

6. In what way have they affected your relations with the children?

7. Can you mention any particular effect of the play upon individuals?

8. Have you noticed any effects or results of games different from those of gymnastics? If so, please make comparison.

Teachers were unanimously in favor of an afternoon play period. Reasons: "Rests mentally and physically"; "is a recreation"; "enjoyed"; "many do better work after"; "more willing to work."

Physical benefits: Great majority say yes, but specific physical advantages not generally mentioned; "fine recreation"; "slow children learn to walk and run faster, get less weary with day's work"; "sit better and are more quiet without being asked."

Mental benefits: "Gain in ability to think and act immediately"; "several nervous girls play more intelligently than at first, and for some reason do school work better"; "brighter and think more clearly after a game"; "seem more ready for hard work"; "work better."

Moral benefits: "Boys more gentlemanly towards girls"; "self-control and respect for rights of others"; "show tendency to dishonesty in games"; "better natured after play period."

Objections to games: "Some people might regard noise as objectionable"; "danger of over-fatigue in weak children, as in jumping games"; "no harm except occasional bumps. These same bumps give opportunity for display of courage"; "possibly a desire to cheat, and the rivalry too intense"; "raises a dust"; "noise"; "danger of use of games ill adapted to age of children."

Effects on school work: Much testimony as under the first question; the great reason for having games, in mind of the teachers, is that the children do better work after. "Less noisy and restless"; "more zest in work"; "fresher and more willing to work"; "an incentive to good work"; "more earnest in work after play."

Relation between teacher and pupils: Much favorable testimony. "Can control children more easily"; "better feeling towards teacher"; "make me as one of them"; "with common interest"; "think we are drawn nearer to each other"; "for a time teacher becomes as one of the children, with equal rights and privileges"; "teacher grows to know the children as she could not in the ordinary school work; all know and understand each other better"; "makes pupil feel that teacher is interested in their plays as well as their studies"; "a hold on children is obtained more easily"; "have discovered many personal traits not previously noticed"; "children more responsive."

Specific effects on individuals: Not much given. "Develops selfishness in one boy to a great degree"; "creates activity often when mind is sluggish"; "cures listlessness; this true of whole class, as well as individuals"; "think it made K. S. and F. C. a little more prompt"; "a pupil one day seemed disinclined to work, in fact, was sulky and disagreeable; after game forgot temper and worked pleasantly"; "two pupils have learned to run faster, at first they would only walk"; "one boy tries to await his turn more pleasantly"; "two girls show more animation"; "games wake up the slow pupils"; "they seem a tonic for sluggish brains."

Just a word further about the influence of games on the morals

of the school. I feel constrained to venture here this much: A superintendent in Massachusetts came to me and asked me what he could do in the way of games in a particular school where discipline was very difficult, where boys did not play, but resorted to mischief. I suggested what I could, and I wish to read a portion of a letter from that superintendent to me:

"If you had known the school three years, you would notice a great change at the present time. Doubtless many other things have helped in the improvement of the pupils, but I cannot help feeling that much credit is due to the encouragement of plays and games. It not only furnished them amusement and kept them from plaguing the smaller pupils, stealing from neighboring orchards, etc., etc., but it changed their attitude towards some of their teachers, rendered them more respectful and obedient, and made their school work more vigorous."

Note that this testimony, even under the different heads, seems to center upon the recreative effects of the play period. Children are better natured, forget their temper, are more easily managed, more responsive, take up work with more zest, do better work, wake up; all these statements are direct testimony to the relief of mental fatigue by means of active play. I have much faith in this kind of testimony, but we ought to have something more than this. Can we measure the relative relief of fatigue in school children of the play and of the gymnastic period? I have endeavored to do a little experimental work in this direction. Sets of examples in multiplication similar to those given by Dr. Thorndike in his fatigue tests were given to ten classes ranging from the third to the ninth grade. The figures 6, 7, 8, 9, were used in the multiplicands in varying order, and the figures 2, 3, 4, 5, similarly, in the multipliers. Four tests were given each class. These were given by the regular teachers. The examples were put on the board, concealed from the children.

The teachers were requested to conduct the tests as regular school work, so far as possible. One set was to be given after a gymnastic period. The children were then set to work upon these examples for exactly ten minutes. The number of multiplications and additions were carefully counted, and the number of errors. Under as similar conditions as regards kind and amount of previous work, time of day, and the like, as possible, on a following day, a similar test, involving same figures, but differently arranged, was given after a period of play, and combinations and errors computed as before. The second two

tests were like the first two except that the multiplicands and multipliers were inverted. To obviate any possible increase in number of multiplications due to practice, games were given first in the second set and gymnastics second. There was further evening up from the fact that half the schools began the first test after gymnastics, and the other half after games.

THIRD GRADE.

	After Games.	After Gymnastics.	Percentage Gain after Games.
Number computations....	3,472	3,332	.042
Number errors	112	146	.011

FOURTH GRADE.

	After Games.	After Gymnastics.	Percentage Gain after Games.
Number computations....	5,759	5,164	.11
Number errors..........	75	59	(loss .002)

FIFTH GRADE.

	After Games.	After Gymnastics.	Percentage Gain after Games.
Number computations....	3,265	3,192	.022
Number errors..........	197	170	(loss .007)

GRADES THREE TO FIVE.

	After Games.	After Gymnastics.	Percentage Gain after Games.
Total number computations	12,496	11,688	.068
Total number errors......	384	375	.002

Play and gymnastics are often compared. It is not my purpose to make any odious comparisons. When each is used in its proper place and degree, no comparisons are called for. In what is understood as a general exercise, games and gymnastics have common purpose. But in mental and moral significance, in recreative effects, in general purpose in school work, they are largely distinct, and approach each other only as gymnastics take on the form of play, or play the form of gymnastics.

Since play is a manifestation of inherited impulses and repeats modes of activity which have determined the physical development of the race, it is reasonable to suppose that play under ideal conditions would furnish for young children the best possible form

of general physical exercise. The play of the young children on the playground includes games like tag, racing, ball, bean-bags. hoop rolling, rope jumping, I spy; plays like keeping-house, playing horse, dolls, sand pile plays, swinging, teetering, climbing, sliding, balancing, pushing, pulling, carrying. There is scarcely a movement or exercise executed in the life history of the race that has not its counterpart here. Can these movements of the child, impelled by instinct, following his own ideals, executing his own self-conceived purposes, unconscious of his movements, but every motion eloquent with thought and feeling, himself pervaded by a deep sense of joy in it all,—can these plays be profitably supplanted by dictated, formulated, externally imposed exercises, and meaningless, expressionless, self-conscious movements, devised by the most skilful teacher who ever lived?

In general physiological effects, in recreative power, in overcoming fatigue, and in development of endurance and desirable mental and moral qualities, gymnastics must take second place to games. These are the prime objects of physical training. In the second object, namely, the correction of deformities, gymnastics undoubtedly leads.

In the case of young children, say up to seven and eight years of age, except in cases of deformity, I should be in favor of abandoning the "day's orders." When the public school systen has the child fairly in its clutch, bearing down upon the youthful shoulders, pressing in the hollowing chest, and slowly bending the head and crooking the spine, I should say gymnastics were essential. But I believe more individual work should be given, even at the expense of class work.

Another distinction to be observed in the use of games and the use of gymnastics should be emphasized. Gymnastics should not be given as a recreation. They should be regarded as a study, and as such are deserving a place in the curriculum. They may be made interesting by the skilful teacher, they may serve as a change in the work, they may set stagnant blood circulating, but they are hard work, they are exhausting, they require the same expenditure of nervous energy that regular studies require, they do not relax. I believe that many of the differences between the advocates of gymnastics and those opposed to them might be dispelled if this distinction between play and gymnastics were generally borne in mind.

THE HYGIENE OF INSTRUCTION.

(*An Abstract.*)

BY STUART H. ROWE, PH.D.,
Supervising Principal, Lovell District, New Haven, Conn.

The hygiene of instruction is a phase of school hygiene which has only recently attracted the attention of students. It practically resolves itself into a study of those features of educaional principle or method which are most likely to result in worry, confusion and a state of flurry, interference with the steady progressiveness of work, and the deadening of the self-active power.

Sound pedagogy is and must be hygienic. Hygiene shows incompetent teaching to be a crime. And even sound educational principle may become quite unhygienic in its practical application. Correlation may, for example, result in greater clearness and greater definiteness in what is learned, or, on the contrary, in the hands of a shallow enthusiast may work to confusion and the waste of energy.

In spite of the saving in time by increased efficiency in the teaching of reading, writing and geography, the problem of over-pressure is still a serious one. The reduction of the arithmetic to essential forms capable of universal application, the elimination of scientific grammar and the substitution of the reading of geography or history for the learning of them by heart are among the most important suggestions for the solution of the problem of over-pressure.

The isolation of subjects may be desirable, but the isolation of groups of ideas for the sake of a clearer survey establishes the limits of ideas, makes crude ones more complete and thus does away with worry and confusion. This isolation may be found (1) in the separation of the specific aim from the general aim of work, (2) in the determination of the general divisions into which the subject would naturally fall, or (3) in an isolation of or a concentration upon specific directions which the child's effort is to take as he applies what he has learned.

The teacher's manner is a frequent source of worry and strain. Undue severity, fidgeting, nervousness, arbitrariness, and variability in his requirements all have their harmful effects on the children.

Co-operation as a substitute for competition will be found very healthful in the management of the school and the conduct of

the recitation. It is not, however, adapted or adaptable to all sorts of conditions. Self-government may under some circumstances be far more conducive to worry than military discipline. Whatever form of government is employed must be determined by its hygienic aspects as well as its executive efficiency.

Punishment, i. e., law plus the consequences of violating it, should be deep down in the child's consciousness, not on the surface where it will obstruct all activity.

Drills in any subject are to clinch points and so reduce worry. They should also call into play the self-activity if we are to avoid their tiresomeness. Nagging is as prolific a source of physical unrest as any one element of a teacher's manner.

Our whole system of marking is, in a sense, unhygienic. If we can secure some scheme by which a child may be rewarded according as he does his best, we shall make a long step toward hygiene and toward ethical teaching in our schools.

In the teaching of arithmetic, there is a general muddling of the child by teaching him not only addition, subtraction, multiplication and division of whole numbers and fractions all at once, but measures of all kinds as well. There should be a separation of addition and subtraction from multiplication and division, and of the other independent processes and tables from each other, each year being responsible for progress in some specific department of number. Give the children some information which it is not absolutely necessary for them to remember.

Grammar is a subject fruitful of worry, etc., and should be abolished from the elementary course. It is unnecessary and useless, and owes its preservation to conservative public sentiment and fallacious pedagogical thinking. *Spontaneous expression* based on good examples and furthered by healthful criticism with a generous amount of practice is the important matter.

In this study of geography more system is desirable. Starting with the child's surroundings as a natural center, we may reach out to the places from which food, clothing and shelter are provided and where the markets for our own products are to be found. The child should visit places in imagination, always keeping in mind the three objective points—where men are, what they are doing, and why they are doing it. Recognize the varied interests of children in this study.

Inaccuracies and half truths, together with the rambling hit-or-miss character of most elementary study of natural science, are responsible for grave hygienic errors in an otherwise natural and almost recreative subject.

Grouping historical events by administrations or reigns and overburdening the verbal memory is conducive to nervousness, while the disregard of its relation to other studies and of the

interest of the child must be overcome before history teaching can be said to be sane or sanitary.

During reading exercises pupil and teacher frequently relax consciously or unconsciously. Well directed effort within reasonable limits is healthier than relaxation.

The child should write something he really wants to write. He must keep his eyes fifteen inches from the paper and should use the blackboard or large writing for all first attempts at expression.

The requirement of too fine work in drawing and the use of lead pencils or charcoal where color (paints or crayons) could be used, are the chief hygienic errors in this department of teaching.

Gymnastics are too often formal and meaningless, and given with closed windows. The exercises should be given out-of-doors. If they do not really, and they frequently do not, accomplish something for the child that play would or could not, they should be ruled out and the latter substituted. They must never take the place of the recess.

The health of older children, their increased sensitiveness at the adolescent period, and the co-operation and definite agreement, on the part of their teachers, in the adjustment of the work, so that it will pull steadily, need more careful consideration.

Abnormal or deficient children should be placed in separate rooms until they can take their places with normal children and are able to cope, for a time at least, with the work their schoolmates are doing.

Hygiene marks limitations, offering few suggestions outside of its own field; but the effect of false method is as certainly injurious as it is insidious.

The meeting was then adjourned.

EVENING SESSION, 8 P. M.

Hall of the Board of Education.

The Chair announced the following Committee on Revision of the Constitution:

Dr. J. M. Seaver, *Chairman.*

Dr. D. A. Sargent,
Dr. Watson L. Savage,
Dr. James C. Babbitt,
Dr. J. H. McCurdy.

An address of welcome was then delivered by William H. Maxwell, City Superintendent of Schools, New York City.

Alfred T. Schauffler, A.M., Associate Superintendent of the public schools, Borough of Manhattan and The Bronx, and representative of the Board of Education at the Paris Exposition, 1900, made an address, illustrating with Moving Pictures (as shown at the Paris Exposition) of physical training, manual training, fire drills, assembly and dismissal, etc., in the public schools of New York.

FRIDAY, APRIL 19, 9.30 A. M.

COLUMBIA UNIVERSITY.

Sectional Meetings—Section on Anthropometry. Fayerweather Hall, Room 604. Franz Boas, Chairman, Columbia University.

The Chair read the following paper.

STATISTICAL STUDY OF ANTHROPOMETRY.

BY FRANZ BOAS,
Columbia University.

During the last few decades a vast amount of anthropometrical material has been collected. By far the greatest part of this material and the most valuable has been collected by the directors of gymnasia connected with colleges, schools, and associations of young people, so that the average anthropometric type of the young American may be said to be fairly well known.

The material has been collected largely from a practical point of view. The main object of our measurements is to determine how the physical development of a given individual compares with the average physical development of the group to which he belongs. The observed deficiencies in his development determine the selection of gymnastic exercises by which the physical development of the subject may be improved. The application of anthropometry to practical work in the gymnasium is founded on two fundamental assumptions: First, that the average measurement represents an ideal type; and, secondly, that small variations from the type may be considered as physiological variations. I wish to discuss these two fundamental assumptions in some detail.

It has often been pointed out that the average type obtained by a series of anthropometrical examinations includes not only those individuals who are perfectly healthy and normally developed, but also others who are deficient in one or the other respect. If abnormality had an equal tendency to increase or to decrease the normal measurement, this cause of variation might be disregarded. It would seem, however, that most of the causes of abnormalities bring about a retardation of development with the

result of a final diminution of the value of the measurement. Malnutrition causes decrease of stature. Deficient development of the lungs results in small thoracic circumference and capacity. Disuse of muscles results in lacking development of muscular parts. We may therefore conclude that our types, as obtained from miscellaneous measurements, represent a somewhat pathological type, not by any means the ideal that would be observed if our type were constructed from measurements of individuals of absolutely perfect health record. Since the general sanitary conditions improve with increasing wealth, it is probably safe to assume that the differences observed between the physical development of the poor and those of the wealthier portions of our communities are due largely to the elimination of unfavorable influences.

From this point of view it would seem desirable to subdivide the subjects measured in a number of classes according to their health records. Such classification must be founded partly on the history of each case, partly on the observations of the gymnasium director. The metrical results obtained from the best class would be most likely to give us an insight into the form of the normal individual. As defined in this way, the normal individual would not be the one whose form is the most frequent, but the one whose form would be most frequent if conditions were as favorable as possible during the period of development.

A second important question which arises in this connetion is whether it is justifiable to assume that there is one and only one ideal type, which all the individuals of our community approach. If different classes of our community represent different types, it would evidently be incorrect to measure the abnormality of an individual by comparison with one single ideal type.

As a matter of fact the individuals measured in our gymnasia differ in regard to their ages, their descent, and the environments in which they live, and it is necessary to decide whether it is justifiable to disregard all these influences. Our American population embraces descendants of practically all European nationalities, and, therefore, includes representatives of all the different types inhabiting Europe. Speaking in a general way we may say that we must distinguish at least three types among the European populations: the blonde, tall, long-headed type of Northern Europe; the dark, tall, short-headed type of Central Europe; and the short, dark, long-headed type of Southern Europe. These three types must have been distinct for exceedingly long periods, and possibly the present distribution of European types may be considered as a resultant of

their intermixture. I do not mean to say definitely that the three types enumerated here are the only fundamental European types. The views of anthropologists on this point vary to a certain extent, but it is sufficient for our purpose to recognize that in our population the three types enumerated here are represented with a rather strong preponderance of the North European type.

If we happen to measure an individual belonging to the Central European type, we must compare his measurements with the ideal Central European type. It would, evidently, be wrong to compare him with the standard obtained from measurements of North Europeans. For this reason the method of judging the physical development of an individual belonging to a population of mixed descent by comparing him to the general type does not seem free of objection.

The same is true in regard to the effect of age, which factor becomes of the greatest importance in work among growing children. When we measure a sixteen-year-old boy we are by no means certain how near the particular boy is to the adult stage, how nearly he has completed his development. The most superficial examination of the physical and mental development of children and of adults brings out the fact that the physiological development of the individual cannot be measured by years only. We observe children who are precocious; who are in every respect in advance of their age. We observe others who are physically and mentally retarded; while later on the same children will overtake those who previously were far ahead of them. The same phenomenon may be observed when we compare the physical development of older people. With some, the period of decadence begins before the fortieth year is reached, while others retain their full vigor until much later times. The distinct signs of old age also appear in different individuals at widely differing times. It is, therefore, evident that the whole current of life must not be measured by years alone, and that individuals vary, if we may use the expression, in regard to the velocity with which they run through their life's course.

I may say here that this way of considering the phenomena of growth, development and decay gives a sufficient explanation of all the peculiarities observed in anthropometrical statistics of children, and that for this reason I consider this mode of considering the course of human life as fully consistent with observation.

Bearing in view this fact, it is evidently not sufficient to classify individuals according to their ages, but we must also bear in mind the acceleration and retardation of individual development.

But it may be asked, how is it possible to determine in each and every case the type with which the individual must be classed, and the period of development which he represents?

It would seem that at the present time neither of these questions can be definitely answered. The correlations of the series of measurements characterizing the various European types have never been determined, and the correlations characteristic of various periods of development are also unknown. It would therefore, in the present stage of our knowledge, be largely a matter of judgment on the part of the gymnasium director, how to classify each individual according to his general characteristics; or it would be necessary to establish a number of tentative classes in which the individuals might be arranged.

It appears, however, from these considerations, that it is highly desirable to subdivide the anthropometrical material collected in gymnasia in a most minute and painstaking way in order to investigate in how far it will be feasible to class any individual with a definite type. I do not wish to convey the impression that I consider it feasible even after the most extended statistical investigation of anthropometrical material to establish a number of clearly distinct types, the variability of each of which would be so small as to allow us to class any individual with a definite type. I only desire to point out the necessity of classifying our material from various points of view, and of adapting each individual to the class to which he most probably belongs.

I may be allowed to indicate in which manner a diversity of type would probably manifest itself in a series of measurements. It is one of the fundamental laws of correlation that in a homogenous series deviations from any typical measurement are proportionate to the excess or deficiency of any other measurement. Taking, for instance, stature as a standard, the following condition would be found: If one man is, let me say, ten centimeters in excess of the ordinary stature, another man twenty centimeters in excess of the ordinary stature; then the excess of chest circumference of the second man will be twice as large as the excess of chest circumference of the first man. If, however, the tall individuals should happen to belong to a type different from that to which the majority of short individuals belong, then this law would no longer hold good. We have, therefore, a means of discovering in our extensive anthropometrical series a mixture of divergent types. This investigation is an important one and should be taken up at an early date.

I wish to bring to your attention another point which seems to me of vital importance. We are accustomed to consider the types represented in our tables as constant. We speak, for instance, of the typical measurements of an entering class, and

of those of a graduating class. There is a change in the values obtained from these two classes. This change is due to a gradual development. Our point of view is, therefore, only a rough approximation to the actual conditions. The anthropometrical problem is not a statical one, but a dynamical one, and we should take into consideration the rates of changes characteristic of various individuals and their effect upon the distribution of measurements. If we include this problem in our plan of researches the problem becomes vastly more complex, but at the same time vastly more interesting, because the physiological changes in the individual and the types and variabilities of these changes become accessible to investigation.

For these purposes we need repeated measurements of the same individuals. We must not confine ourselves to comparisons of general anthropometic tables, but we must compare individual measurements with individual increments. The study is still in its infancy, but its importance is far-reaching. It makes it incumbent on our observers to use the most painstaking care in their measurements, and to avoid all rounding off. The increments are in most cases so small that errors introduced by the process of rounding off may be larger than the values which must be investigated. If, for instance, measurements of statures of boys of 16 or 17 years are made, it will be seen that the small average increase may be completely obscured by the inaccuracy of measurement and by the process of rounding off to the nearest full or even half centimeter. If we wish to make progress in this important branch of our inquiry, the very highest accuracy of method of measurement must be demanded.

It is important to bear in mind that questions of this character are not merely of theoretical value, but will also lead to a new point of view in the practical application of anthropometrical results.

The second question which I desire to discuss relates to the scope of physiological variation. We know that no two organisms are absolutely alike, and that natural processes lead to slight differences of form in different individuals belonging to the same type. It is only when these variations assume excessive values that we are justified in speaking of pathological cases in so far as the combination of measurements observed is a rare one, and therefore likely to be due to abnormal causes. What, then, is the range of physiological variation? When we are dealing with single measurements we may, perhaps, assume that all those individuals are normal which represent the middle half of the total series of measurements. The lowest measurements and the highest measurements, both of which combined constitute the other half of the series, might be considered as abnormal.

When we consider two measurements of the same individual, the question becomes somewhat more complicated. If the two measurements are not correlated at all, if the one changes without influencing in the least the other, we might say again that that series is normal which embraces the middle half of the two measurements. Evidently we should measure the normality or abnormality of a certain combination by the frequency of its occurrence. The average type in regard to both measurements will be the most frequent one, and slight deviations in both directions will have comparatively high probabilities. In the particular case which we are discussing here, namely, when both measurements are entirely independent of each other, it is evident that an individual which has a small deviation in one respect and no deviation at all in regard to the second measurement, will be more frequent than an individual which stands, as we are accustomed to say, in both respects on the same percentil grade. Supposing that stature and transversal diameter of the head were entirely independent of each other, it would be more probable to find a tall man with the average transversal diameter of the head than a tall man with a correspondingly large transversal diameter of the head.

As a matter of fact, there are hardly two measurements that do not influence each other to certain extent. This fact is easily seen when we tabulate the measurements of tall people and of short people. It will be found that on the whole the measurements of tall people are larger than those of short people, although the increase of the average measurement is not proportionate of the increase or decrease in stature. In all these cases that combination is most probable for which the second measurement bears a certain characteristic relation to the first measurement, which is determined by what we call the coefficient of regression.

It appears from these considerations that a type which is characterized by a series of measurements, all of which represent the same percentil grade, and which, on our anthropometrical charts, would be represented by a number of points standing very nearly on the same level, is *not* as probable as a type which in one of its measurements deviates considerably from the average type, while in all other respects it has only a comparatively small deviation from the average type. This considerable deviation may occur in any of the numerous measurements which we are in the habit of taking. And for many combinations of deviations, one of which is large while the others are small, the frequency of the type will remain the same. We find, therefore, as a result of these considerations, that the most frequent types, and for this reason the types which we must consider as inside the limits

of physiological variations, are not by any means those which in all respects are enlarged or reduced replicas of the average type, but such that deviate more or less from this type in regard to a few measurements only.

I have tried to point out in these remarks a few directions in which it would seem that our anthropometrical material may be made more useful and more significant than it is at the present time. I am fully aware of the difficulties and of the vast amount of labor involved in carrying out any of the suggestions here outlined, but I fully believe that any labor devoted to this matter will be repaid by results interesting from a scientific point of view and valuable for the gymnasium director. Much can be attained by hearty co-operation, and I hope that our deliberations may lead to a way of making the vast amount of anthropometric work that we are doing more useful in scientific and practical lines.

THE VALUE TO PHYSIOLOGY OF ANTHROPOMETRIC TESTS AND MEASUREMENTS IN THE FORM OF STATISTICS AND THEIR IMPORTANCE TO EDUCATION.*

BY H. G. BEYER, M.D.,
United States Navy.

The great value of statistical records to the physiologist, as a means of studying certain physiological events, is, I believe, generally recognized. From the point of view which interests us most, these refer principally to changes in growth and development as they follow a certain definite chronological order. Thus, for example, if we were in the possession of a complete set of statistical records, taken in the order in which they occur or succeed each other, of the developmental stages of a number of human beings and their component organs, from the moment of their conception to the time of their death, who can doubt that such records would serve to contribute very largely also to the physiological history of the growth and development of an average human life?

Up to the present time, however, we have but a few scraps of such a history. Imperfectly known as are these physiological events, we have long since attempted to promote and further them by a process known as training or education, here used in the broadest sense. In the course of time we have found out that the exercise of the normal function of any organ or tissue, besides giving us a measurable amount of work, will exert a reflex influence upon the structure, growth, and working capacity of that organ or tissue. The results of experiments in this direction have invariably shown that these assumptions were justified under certain well defined conditions and circumstances. In the living animal body, under normal conditions and at rest, we find a condition of tissue equilibrium.

Tissue equilibrium exists when assimilation and disassimilation are of equal value; it is disturbed by outside stimuli or irritants, because most of these do not affect assimilation and disassimilation alike.

It is one of the most important provisions in living things that, after an irritant ceases to act, the tissues return to the state

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of equilibrium, owing to the internal auto-reconstructive tendencies of a living organism.

If, for instance, a certain irritant or stimulus, as exercise, had acted upon dissimilation, upon the destructive phase of tissue metamorphosis, in a living substance, the assimilative phase would under normal conditions become secondarily engaged in making good the loss occasioned by the stimulus acting upon the dissimilative phase in the process. When, however, an irritant or stimulus, with an effect upon dissimilation alone or almost alone, has continued to act for a certain length of time, there is finally brought about a condition in the living substance, due to an accumulation of waste products, and this condition is known in physiology as *fatigue*. The essential characters by which this condition is recognized are lowered excitability and a decrease in the amount of work done in a given time by the particular organ or tissue concerned. A careful study of this condition in its relation to training and education is of the utmost importance.

Let us, therefore, try to give it a place in our scheme and so help to fix its relation to our work in our minds. We know that absolute inactivity of any organ or tissue is followed by a process known as degeneration, and that activity, carried beyond the normal range of the endurance of an organ, is followed by exhaustion and paralysis. Between these two extreme limits lies the normal range, and somewhere within it we must find the optimum point of activity which corresponds to the maximum capacity for work and which has the most favorable reflex influence upon the normal growth of any organ concerned.

Both degeneration and exhaustion border on the domain of pathology and are, therefore, rarely subjected to investigation on the part of the physiologist. But shortly before we reach the point of exhaustion, on the downward arm of our binomial curve, we arrive at a point where we meet with a condition known as fatigue, and this being still considered within the physiological range, has been formally studied and investigated by some of our best physiologists. As teachers, as educators, as the professed promoters of normal growth and development in human beings, entrusted to our care by a confiding public, our first duty must be to do no harm under any circumstances. Our next duty is to influence for good the education of our charges. In order to discharge our full duty in this regard we must know (1) the danger points and signals, and (2) also the point or the conditions under which our work has its maximum beneficial effect. An acquaintance with that point within the physiological range at which the activity of any organ or tissue which we wish to

place under the more favorable condition for development produces its optimum beneficial effect, is a necessary preliminary to success on the part of all educators. This point must lie about midway between the two danger signals, namely: absolute inactivity followed by degeneration, and exhaustion followed by paralysis from over-exertion. It must, moreover, lie at a point before fatigue occurs, for we have already seen that fatigue precedes the condition known as exhaustion and is itself due to the accumulation of the products of wear and tear, hence no longer presenting the most favorable conditions for growth and development.

I know of no instrument that has served to give us more real information as regards the normal or physiological range of functional activity than has the ergograph, simple as it is. The ergograph, at present, appears in two forms. In the case of the original instrument of Mosso, a muscle contracts against the resistance of a constant weight, while with the spring ergograph, employed by Binet, Catell, Franz, Hough, and Schenck, the resistance is variable, and allows the contracting muscle of a certain degree of choice or selection. The muscle here lifts what it can and no more.

Physiologically considered, the curves produced by Mosso's original instrument and by the spring ergograph respectively have a significance of far greater difference than would at first sight appear. From a merely mechanical point of view, and somewhat roughly speaking, the difference between the two instruments is practically the same as that between the Sargent chest-weight on the one hand and the Whitely exerciser on the other. If we examine the curves produced by either the ergograph of Mosso and the spring ergograph respectively, and apply to them a certain arbitrary test represented by the formula $\frac{P.}{R.\ r.}$, where P. is the power of the neuro-muscular mechanism, R. stands for the resistance offered by the weight, and r. for the rate with which the weight is lifted, we find the difference to be as follows: The above fraction in Mosso's curves is, at first, for a short period equal to one and then rapidly loses, becoming less than one, and, finally, ends at zero for a numerator. In the curves obtained by the spring ergograph, our fraction begins by being at first slightly greater than one, and then slowly reaches a point at which it remains equal to one throughout.

Recent experiments by Verworn on fatigue, both with the ergograph on man and on the frog, with the usual recording instruments, have shown that both in muscle as well as in the central nervous system, excessive activity is followed by fatigue and exhaustion. Fatigue is that condition which is due to the

accumulation of the products of wear and tear, and of which CO_2 is undoubtedly one; and exhaustion, on the other hand, is due to the lack of material necessary for the building up of the lost substances, and of which oxygen is at least one. Exercise of an organ stimulates the destructive phase, rest the assimilative phase.

Whenever the dissimilative phase is greater than the assimilative phase, which is the case in excessive exercise, the products of wear and tear accumulate in the tissue, and a decrease in the work done is bound to follow, for this constitutes the condition known as fatigue. Whenever the dissimilative stimulus is exactly counterbalanced by the assimilative phase, it is a sure sign that the neuro-muscular mechanism has reached its maximum point of efficiency and is doing as much as it is capable of doing, but is *not yet fatigued.*

In the curve obtained by the spring ergograph, it would appear that these two phases exactly balance one another, and thus a condition of tissue equilibrium is steadily maintained. The curve, therefore, is not strictly speaking a fatigue curve, but rather a maximum efficiency curve. In the Mosso curve we meet with a steady increase in the dissimilative phase until the amount of fatigue thus produced prevents the lifting of a given weight, although the neuro-muscular mechanism is still able to lift a smaller one. Applied to our fraction, we find that P. becomes smaller with every new contraction as long as R. r. remain the same, as they must under the condition of this instrument. With the spring ergographic curve, the sensori-motor reflex arc, after a short time, picks out such a level as shall exactly correspond to a condition of tissue equilibrium or of its working capacity, without detriment to the tissues involved. It might then be used as a means of ascertaining the working capacity of any organ to which this instrument can be applied, and to give at the same time the degree of training which it has received or is capable of receiving from time to time and under a given number of different circumstances and conditions.

The curve, therefore, must be looked upon as of the highest importance in our work. Since we know that prolonged muscular- as well as brain-work is followed by practically the same results, and that the fatigue and the exhaustion in both are due practically to the same causes, the principle and the accurate appreciation of the same underlie all educational efforts, mental as well as physical. We have the best of reasons for assuming that the activity of any organ, whether brain or muscle, when kept within its normal range of physiological endurance, excites or stimulates the growth and development of that organ by stimu-

lating alike both the dissimilative and the assimilative phases; when carried beyond the normal range, or even the point of fatigue, it has the contrary effect.

Growth means that the supply of energy which follows a demand upon it must be greater than that amount which was demanded, for it is in this manner alone that exercise can be followed by an increase in working capacity. The same physiological process then underlies all successful training. All training and education have their physical basis in a living organism, although every organ in it has evolved, within its own substance, its own peculiar specific energies, and the same stimulus produces reactions that differ with the particular organ upon which it acts.

But the reflex arc, through which we are trying to develop, train, and educate different parts of our anatomy, consists in all essentially of the same elementary parts, namely: (1) A peripheral sense organ (in which we would include the tactile-, pain-, and temperature-sense in the skin); (2) an afferent nerve; (3) a sensory center in the spinal cord; (4) an association of centers in the brain, producing conscious impressions; (5) a motor center in the spinal cord; (6) an efferent nerve; and (7) a neuro-muscular end-organ. All these various structures are capable of being developed and trained, brought to a higher degree of efficiency, when acted upon under favorable conditions, and well within the normal physiological range of their capacity; they are liable to become fatigued and exhausted under the contrary conditions; they may also undergo repair and restitution by rest and sleep, owing to the auto-reconstructive tendencies peculiar to all living things. For the physiologist, then, it makes no essential difference whether you train a child in the mastery of the three R's, or whether you teach it to play a musical instrument, to run or to jump, the process in its essential and elementary parts is physiologically the same in all. And, as long as the training requires the man to be in the state of consciousness, the brain, this great central power house of his entire machinery, must always receive the attention in keeping with its importance. Thus, training in which muscular contractions form a prominent part, in the physiological sense, is no more exclusively physical than the training of a child in the art of writing or reading is exclusively mental. In all a certain reflex sensori-motor arc, with the brain as the center of consciousness, is engaged in doing a certain amount of work, intended for the increase of its working capacity, and the special education of a certain part of our anatomy would simply mean that our purpose was to raise the specific energy in that particular part to a higher

degree of efficiency than it could be expected to reach without such education. Physical training has entered the scientific stage in its development, and has long since ceased to look upon the mere increase in size and strength of muscle as the highest of its aims. In training for grace and manual dexterity, for instance, the mere increase in the size of muscle may even be looked upon as a most undesirable by-product. An enlargement of the tongue would certainly not constitute the highest nor the most desirable attribute of an orator. In a most general sense, our aims are to bring about a proper and symmetrical adjustment between all the parts of our anatomy, so that, in the words of Huxley, the body becomes the ready servant of the will, and "does with ease and pleasure all the work that, as a mechanism, it is capable of," and together with the intellect forms "a clear, cold logic engine with all its parts of equal strength and in smooth working order."

Having dwelt briefly on the physiology of the training of the body as a whole, which practically implies an attempt of making one part of the body as good as every other part, we must now look for a moment at the physiology involved in some of the results that have been obtained by the training of special parts of our anatomy, and the relation and indirect influence which such parts bear to the rest of the body. In connection with this subject we are, in the first place, reminded of the work of Scripture, published about a year ago, on what he called "Cross-education." The physiological principle which is involved in the results obtained by Scripture's simple experiments seems to me of an importance so far-reaching and fundamental from the point of view of training, that it should have been followed up with greater interest. Scripture's results would show that the exercise of one arm is followed by an increase in the strength and circumference not only of the arm thus exercised, but also of the one on the opposite side, and not doing any exercise. The measurements on that occasion were made by Dr. Seaver, and we, therefore, must conclude that they were taken with sufficient care to insure us their accuracy and correctness.

Here, then, we would have an instance in which the special training of one part of our anatomy is seen to have an indirect influence upon remote parts. Such results as these would appear to support the idea that the exercise of our muscles might, indirectly, favor the performance of intellectual work. That this necessarily must have its normal limits we can assume with perfect certainty; but what these limits are we as yet have made little progress towards finding out. All we do know so far is that there exists a functional or physiological correlation be-

tween the different parts, as well as an anatomical one, and that, in training special parts, an overflow, as it were, occurs that affects parts remote from the one under special training.

Considerable interest has been devoted within the last two years to the subject of the relation existing between physique and mental ability. The observations of Porter, Hastings, Christopher, and myself would point to the fact that there is an undoubtedly direct relationship between the two. In a paper which has not yet been published, from the measurements of some three thousand children in Cambridge, this direct relationship is again beautifully shown to exist.

Quite recently my attention was called to an article by W. C. Bagley, "On the Correlation of Mental and Motor Ability." Bagley, from his experiments, finds an inverse relation to exist between motor and mental ability. He, moreover, finds little direct relation to exist between mental ability as represented by reaction times, and mental ability as represented by class standing, except that excellence in either is apt to be accompanied by a deficiency in motor ability. The results of Bagley are very interesting indeed, but have only a remote bearing on the subject treating of the relation between *physique* and mental work; and I should not have mentioned them in this connection had they not misled one of my friends into thinking they were contrary to those obtained by others and myself.

In so far, for instance, as Bagley's data from "experimental sources" are concerned, we will find that the tests which he made for strength, rapidity of voluntary movement, control or steadiness of motor co-ordination, etc., are all tests, combined with certain mental processes, requiring for their execution considerable training if expected to be done well. Our conclusions, on the other hand, are merely based upon physique pure and simple, as determined by a few crude anatomical measurements in a limited number of dimensions, and its relation to the mental work done by children, as the result of the training that they received in their schools. Physique, in my opinion, cannot be made to stand for motor ability. Ability is the normal function of physique, and implies a certain amount of training which is not implied necessarily in the term "physique" as determined by measurements. We may, therefore, assume provisionally, at any rate, that there exists a direct causal relationship between physique as determined by certain measurements, and mental ability as determined ordinarily in schools; for a high percentil rank, as regards physique, is almost invariably found associated with a high grade of mental work in growing children. Knowing, moreover, that muscular exercise,

when administered under the most favorable physiological conditions, is followed and accompanied by an increase in growth of the height, weight, chest circumference, and muscular strength, over and above that amount which occurs without such exercise, physical training would seem to stand upon fairly solid and scientific foundations; for we now can scarcely escape the temptation of making the further deduction from the above two propositions, that whatever gives rise to increased growth in height, weight, and chest circumference must also indirectly lead to increased brain development; and *vice versa,* whatever impairs the normal physical growth must also indirectly impair mental growth.

It is generally held that brain work has an unfavorable influence upon the growth of the body, and one of the great claims of physical trainers is that bodily exercise is necessary in order to prevent the physique of our children from breaking down, while their brains are being trained and educated in the schools. Undoubtedly there must be some good and cogent reasons for this general belief, but have we anything of a more scientific nature than that for our assumption? So far, at least, I have been unable to find anything in literature with regard to this point.

Arguing merely from analogy, it would seem rather paradoxical to a consistent physiologist to find while muscular exercise favorably influences brain development that brain exercise or work should have an unfavorable influence upon the growth of the body.

While thinking about this subject it occurred to me that one of the means of approaching the problem with a chance of getting some light on it would be to compare the growth curve between boys who went through the high school and into college and those who did not, beginning after both left the grammar school; at the same time selecting a class of boys in whom no other essential differences as regards environment and other hygienic conditions exist—in other words, boys in whom the superior mental training which they get in the higher schools can be said to constitute the chief if not the only difference influencing their lives and growth.

An approach to such a condition may be found in the difference in the training of naval cadets on the one hand and naval apprentices on the other. Both classes of boys start about the same age; their work on board ship as well as their drills on shore are almost identical; the food which they get has about the same value in calories, the difference being that the cadets are served better than the apprentices; both get at least eight hours' sleep; the cadets do about the same amount of work with their

hands as do the apprentices; in fact, we have here the rather rare opportunity of comparing conditions of life in which the superior mental training received by the cadets at the naval academy may be said to constitute the chief if not the only difference. Consequently their respective growth curves when compared to one another ought to give some very valuable information with regard to this point.

The necessary material for such curves was found, partly in the growth tables published by me in 1895, partly in the tables not yet published, and compiled from the physical examination records of a large number of naval apprentices and landsmen for training.

MEAN VALUES, DERIVED FROM 4,541 CADETS AND 3,445 MEN AND BOYS, COMPARED.

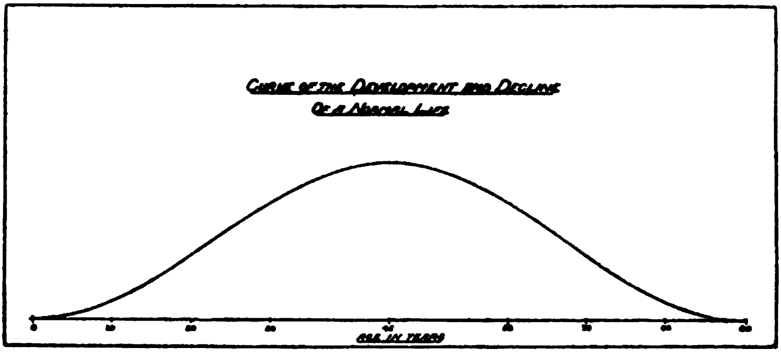
AGE.	Height (In.)		Weight (Lbs.)		Chest Circm. (In.)	
	Cadets.	Men.	Cadets.	Men.	Cadets.	Men.
15	64.29	63.37	108 50	109.00	29.95	30.07
16	65.80	64.01	116.90	114.42	31.10	30.40
17	67.00	64.87	124.80	122.60	31.89	31.34
18	67.63	65.43	131.80	124.94	32.68	31.80
19	67.65	65.68	137.00	128.45	33.25	32.00
20	68.25	65.84	138.50	133.90	33.58	32.50
21	68.21	66.10	138.90	134.90	33.65	33.14
22	68.35	66.31	138.70	140.08	33.77	33.62
23	68.52	66.45	138.30	140.85	33.87	34.00

The adjoining table is intended to exhibit the differences in the mean height, weight, and chest circumference between the two classes of boys. On examining the several columns of this table, we will notice, so far as weight and chest circumference are concerned, the apprentices have a slight advantage over the cadets, beginning with a slightly higher mean in both these dimensions. As regards height, on the contrary, the cadets have a more decided advantage over the boys, having the start of the boys to the extent of a little less than one inch.

From that time on, however, the cadets rapidly gain over the apprentices and forge ahead of them in all three dimensions, up to the eighteenth and nineteenth year; the cadets continue to keep ahead in height up to the twenty-third year, which marks practically the end of growth in height, but allowing the men to pass them in both weight and chest circumference just about the same period. The difference in the mean height between cadets

and men at the twenty-third year is two inches. These conditions may be seen more strikingly represented in the three charts. on page 191. This looks as if brain work might influence favorably bodily development, at least under the conditions here referred to.

The average human life in the 17th century, counting out the devastations caused by epidemics such as the plague, etc., was from eighteen to twenty-two years. Recent statistics have shown that this average has increased to forty and forty-five years, so that we have good reasons for supposing that a normal life, under the most favorable conditions of heredity and environment, ought to last ninety instead of seventy years. Let us try to realize and locate our relation to such a life in our capacity as teachers, trainers, or educators.

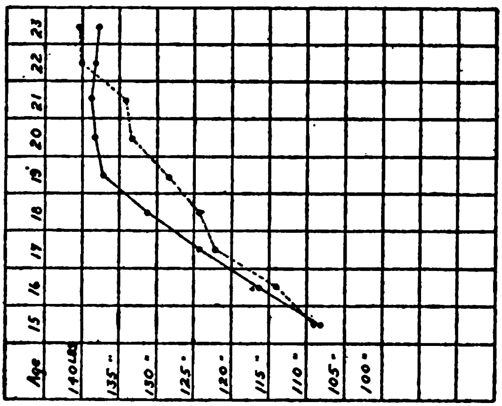


We can do this best, I think, by constructing an arbitrary binomial curve, representing the beginning, the rise, decline, and end of a normal life of ninety years' duration. Dividing, to begin with, this curve into three great periods of thirty years each, we will note at once that the weight of our influence for either good or evil, as the case may be, falls heavily into the middle of the first of these three periods, namely, that included between the tenth and twentieth years of life, tapering off at either end into early childhood on the one hand, and early manhood on the other. The second period, that which is included between thirty and sixty, or the middle period of life, as it might be called, is the one during which man performs his best work. It is the auto-creative period of life. The amount and quality of his work will greatly depend on how he was reared, taught, and educated, and in the free competition of life it will

I Mean Heights Compared.

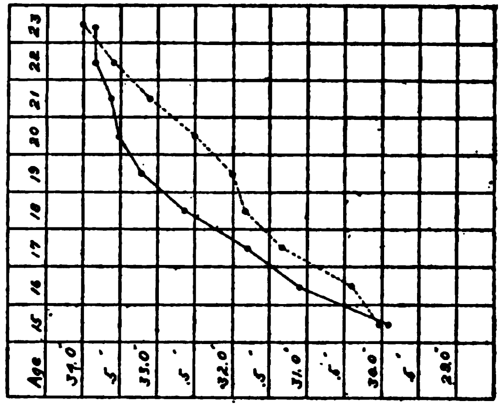
Upper line: Cadets.
Lower line: Men.

II Mean Weights Compared.



Upper line: Cadets.
Broken line: Men.

III Mean Chest Cir. Compared.



Upper line: Cadets.
Broken line: Men.

largely determine the rank and station which a man will attain among his fellow men, amounting in fact to an examination into his real and all around worth and value of thirty years' duration, and of an intensely practical character. While, during the third period of life, that included between sixty and ninety, a man must reap what he has sown, as it were, during both the previous periods. Here nature is very apt to prove to man, in the form of a final reckoning, that a painless decline of his years and a normal death from old age can only be the reward of a correct and useful life.

Having now localized our relation as educators to a single life, we have still much to learn by looking at the mortality curve of a whole nation. It will remind us more especially of the scope of our tasks still before us; of work yet undone or wrongly done. According to Carl Pearson, 605 out of every 1,000 of children conceived die before they are born; very many die in childhood; fewer in youth, more again in middle age, and many more still in old age. The mortality in infancy is indeed so great that even a small reduction in the number of deaths of infants would be a readier means of checking the decline in population of some countries than would any other plan for fostering a higher birth rate.

From a statistical study of the mortality rate, Carl Pearson has made five ages of man, viz.: Infancy, childhood, youth, maturity, and senility. He has expressed his conceptions graphically in an extremely thoughtful and interesting manner. His picture shows the causeway of life in the form of a bridge on which each age is represented as passing, with the marksman Death hovering about and armed with different weapons of precision, killing as the men pass. The idea of the large number of antenatal deaths is represented by man killing his own offspring with his own bones; next, during infancy, a maxim gun sweeps down the living; then, in youth, a bow and arrow is seen in the hands of the marksman; then an old blunderbuss comes; at last, a modern rifle is necessary to pick out each man because the ranks have become so thin.

Enough has been said, I think, of the value of anthropometrical records, as well as statistics in general, and their bearing upon the physiology of education. It was, moreover, clearly pointed out that all efforts at education, whether general or special, involve the training by exercise of a portion of the an-

atomy of the person to be educated; that such exercise, to have the educational value it is intended to have, must be kept well within the limits of the normal physiological range of the endurance and capacity of the parts involved. For purposes of orientation and for the study of the effects and defects of our work, of the flaws in our methods and products, and the problems to be solved in the future, we will find there is much to be learned by a consultation of our mortality statistics.

PSYCHOLOGICAL TESTS AND MEASUREMENTS.

(An Abstract.)

BY JAMES MCKEEN CATTELL, PH.D.,
Columbia University.

No boundary line can be drawn between mental and physical tests. When we measure the growth of the body we are concerned with the relation of this to mental development. When we test eyesight or hearing, we discover physical defects by psychological methods. In all tests of sensation, of movement, of quickness, of accuracy, and the like, we are concerned in nearly equal measure with mental and physical factors. Even such purely mental functions as memory, attention, etc., are dependent on physiological conditions and in turn determine habits and aptitudes. The methods of measurement, of calculation and of correlation are much the same whether our measurements are of the body or of the mind. It may safely be claimed that the psychologist should be familiar with the tests made in the gymnasium, and that students of physical education should not neglect the work of the psychological laboratory.

But this does not mean that the psychologist has as yet accomplished very much. Psychology is perhaps the youngest of the sciences, and at first it concerned itself more with finding facts true for all minds than with searching for individual differences. Fechner and Galton were the pioneers in the study of mental differences. In addition to contributions in other directions, Galton established an anthropometrical laboratory in which some psychological tests were made in the South Kensington Museum, London, about fifteen years ago, and Jastrow arranged a psychological laboratory in connection with the Chicago Exposition. Kraepelin has attended to individual differences with reference to pathology. A committee of the American Psychological Association has recommended a series of tests, and a committee of the American Association for the Advancement of Science is making measurements of the members. Numerous single tests have been applied to several individuals in laboratory researches and with school children, but with the exception of a study by Scripture and Gilbert very little has been done in the way of applying numerous tests to a large group of individuals. Perhaps the only systematic attempt to do this is our series at Columbia University, conducted by Professor Boas, Professor

Farrand and myself, with the co-operation of Dr. Savage of the gymnasium. It is doubtless owing to these tests that I have been asked to take part in this discussion, and a description of what we do will be more appropriate than historical or theoretical considerations.

We make a series of measurements of the freshmen when they enter college, and again at the end of the senior year. The Barnard students are also measured. At the same time physical measurements are made in the gymnasium, and a question blank is answered, giving details regarding heredity, diseases, etc. We have the record of the students in their classes, their performance in athletic games, etc., and the University keeps informed on their success in after life.

The tests made in the psychological laboratory of Columbia University were then reviewed by the speaker, the blank on which the record is kept being distributed. As this blank may prove useful for reference and has not been published, it is here given.

The instruments used in some of the tests were exhibited and the results were described. A blank giving a description of the physical and mental traits of the student as observed by the recorder was also distributed. The blank is here reproduced for the information of those who may wish to make similar tests. The speaker called attention to differences between men and women, and between the students as freshmen and as seniors. Finally the results of calculations recently made by Mr. Wissler were mentioned. These show a complete lack of correlation. That is, a student good in one test is no more likely to be good or bad in any other test than the average student, nor is there any relation between excellence in any test and class standing.

LABORATORY OF

PSYCHOLOGY OF COLUMBIA UNIVERSITY.

Physical and Mental Tests.

Name in full. ....

Class.................... Date of birth..................

Previous tests: Gymnasium?..........Elsewhere?...........

Perception of size...............Right-handed?.............

Size of head { Length. ....
Breadth. ....

Strength of hand: Right { 1............ 2............ Left { 1............ 2............

Fatigue 1........ 2........ 3........ 4........ 5........

Eyesight { Right eye. ....
Left eye. ....

Color vision................ After-images.................

Hearing { Right ear. .... Left ear. .... Perception of pitch { ....

Sense of smell. ....

Perception of weight { 1............ 2............ 3............ ....

Sensation areas 1....... 2....... 3....... 4....... 5.......

Sensitiveness to pain { Right hand. ....
Left hand. ....

Color: Liked.................. Disliked................

Reaction time.		
0..........	....	....
1..........	....	....
2..........	....	....
3..........	....	....
4..........	....	....
5..........	....	....
Av.	....	....

Perception and choice.		
0..........	....	....
1..........	....	....
2..........	....	....
3..........	....	....
4..........	....	....
5..........	....	....
Av.........	....	....

Sensory or motor?.......................................
Rate of perception.............Naming colors...............
Rate of movement...........Accuracy of movement..........
Perception of time. ....
Association. ....
Attention. ....
Apperception. ....
Suggestibility. ....
Imagery. ....

Memory
- Auditory. ....
- Visual. ....
- Logical. ....
- Retrospective. ....

Are you willing to repeat these tests at the end of the Senior year? ....

Do you wish to have a copy of these tests sent you?...........

Date............... Recorded by.........................

"The Function of Anthropometry in the Gymnasium" was presented by Dudley A. Sargent, M.D., Harvard University.

Meeting adjourned.

ATHLETICS AND GAMES OF THE ANCIENT GREEKS.

By EDWARD M. PLUMMER, M. D., Boston, Mass. Reprinted from the American Physical Education Review for December, 1897, March, June, and September, 1898, 61 pages. Contents: I, Athletic Games among the Homeric Heroes; II, The Olympic Games in Ancient Times; III, The Olympic Games in Ancient Times (concluded): IV, Toys and Games for Children among the Ancient Hellenes.

In this series of papers, Dr. Plummer has made a genuine contribution to the literature covering the period of Hellenic physical training. His descriptions are constantly enriched by comparisons with modern methods, showing not only a clear, classical insight but also a sympathy and appreciation for the modern aspects of exercise, which makes his work of special value.

Price, 25c.; to members of the A. A. A. P. E., 20c.; for six or more copies, 15c. each.

MENTAL FATIGUE.

BY DR. HERMAN T. LUKENS, State Normal SCHOOL, CALIFORNIA, Pa. Reprinted from two papers published in the American Physical Education Review, March and June, 1899; 25 pages, 6 plates of curves, 8 tables, paper cover.

Dr. Lukens has been a student of fatigue methods and results for several years, at home and abroad, and has summarized his study in these papers. He discusses the nature and symptoms of fatigue, the apparatus and methods of study, and the results of the study. Appended is a carefully selected bibliography of 55 titles.

Price, 20c.; to members of the A. A. A. P. E., 16c.; for six or more copies, 12c. each.

PHYSICAL TRAINING.

By EDWARD MUSSEY HARTWELL, Ph.D., M.D., Boston, Mass. This is a reprint numbering 108 pages, octavo, of Chapter XII of the Report of the United States Commissioner of Education for 1897–8, 108 pages, 8 illustrations.

Dr. Hartwell's article may be characterized as a suggestive but comprehensive sketch n outline, of the theory and history of physical education, in which he has woven together ithe main portions of his principal published papers. In a sense it is a reissue (though in a much condensed and modified form, owing to limited available space) of "Circular No. 5, 1885," of the United States Bureau of Education, which is out of print, like most of Dr. Hartwell's other papers and reports.

Besides discussing the nature of physical training, and the educational value of gymnastics and athletics, the author describes the principal national systems of physical training, and briefly sketches the history of the most significant and influential recent movements in Europe and America, for the advancement of physical education, in his endeavor to show what the place of physical education is and what it should be in the modern scheme of elementary and secondary education.

Appended is an article of 20 pages, entitled "Significance of Physical Education Among the Greeks as presented in the Anacharsis of Lucian," being a translation with comment and notes of Lucian's "Anacharsis and Solon, or Gymnastics," by Charles E. Lowrey, Ph.D., librarian, University of Colorado.

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Vol. VI. SEPTEMBER, 1901. No. 3

PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF PHYSICAL EDUCATION.

(*Concluded.*)

Held at Assembly Hall, Department of Education, New York City, April 18, 1901.

SECTION ON ELEMENTARY SCHOOLS.

FAYERWEATHER HALL, ROOM 613.

Miss Jessie H. Bancroft, Chairman.

The following papers were presented in the order named: "Action as a Condition of Mental Growth," by Charles H. Judd, Ph.D., School of Pedagogy, New York University; "How Time May be Found in the Curriculum for Adequate Physical Training," by Samuel T. Dutton, Teachers' College, Columbia University; "The Waste of Time in the Teaching of the Three R's," by J. M. Rice, editor of *The Forum.* These three papers were discussed by Mr. Nissen, of Brookline, Mass., and Mr. Ossian Lang, of the *School Journal.*

ACTION AS A CONDITION OF MENTAL GROWTH.

BY CHARLES H. JUDD, PH.D.,
University of Cincinnati.

There can be no question that the distinction which was once so clearly drawn between physical training and mental training is gradually disappearing, and in its place is arising a widely accepted principle of direct inter-relation between these two forms of discipline. While this readjustment of our practical educational ideals has been going on there has shown itself a parallel tendency in psychological science to recognize the fact that bodily

action is related in some way to mental processes of all kinds. As Professor James has put it, "It is impossible to disguise the fact that in the psychology of our own day the emphasis is transferred from the mind's purely rational function, where Plato and Aristotle, and what one may call the whole classic tradition in philosophy, have placed it, to the so long neglected practical side. The theory of evolution is mainly responsible for this. Man, we now have reason to believe, has been evolved from infra-human ancestors, in whom pure reason hardly existed, if at all, and whose mind, so far as it could have had any function, would appear to have been an organ for adapting their movements to the impressions received from the environment, so as to escape the better from destruction."*

While psychology is thus coming to recognize very generally the relation between mental processes and bodily movements as a relation which is universal and highly important, there is a certain lack of clearness as to the exact nature of this relation. One writer, for example, lays emphasis upon the bodily movements which accompany a given mental process, because he believes that these movements are sources of sensation which, returning to consciousness after the movement has taken place, increase the fund of sensory experience. Other writers point out the vagueness and indefiniteness of our sensations of movement and conclude that the importance of movements for mental life cannot lie in the mere muscle sensations themselves.

With this latter view I am disposed to agree most heartily. That the value of movement for mental life is to be described in terms of muscle sensations resulting from these movements seems impossible on the ground of certain of the well-known investigations. For example, take the experiments of Münsterberg, Smith, Breese and others. These investigators made an effort to discover the relation of the slight involuntary tendencies to articulation which accompany all reading or hearing of words or the memory of these words. In certain cases they allowed the subjects of the experiment to learn the words as they would naturally, without any interference with the slight involuntary articulations. In a second group of cases these experimenters caused the subjects to inhibit in some way the tendencies to articulation while the words were being learned. It is found that such inhibition resulted in a very noticeable reduction of the ability to remember the words. In order to eliminate the fact of distraction resulting from the effort to inhibit, Mr. Smith repeated the experiment with a manual alphabet, such as is used by the deaf and dumb, and obtained similar results. Similar facts in other experiments lead these investiga-

* Talks to Teachers, page 23.

tors to the general conclusion that the motor accompaniments of mental processes are always favorable to the formation of lasting mental impressions. And yet there can be no doubt that we are not at all conscious of the movements which are involved in the experiments described. Indeed, it is exceedingly difficult to attribute to these movements any direct importance as sources of sensory factors even in the most clearly marked vocalizations. Such movements of articulation are constantly present in all cases of adult thought. One can frequently see a passer-by who is busy with his thoughts, moving even his lips in incipient articulation, or it is sometimes possible to catch his muttered words. Children in school cannot think intently without immediately beginning to say what they are thinking. And in any stage of mental life the vocal chords respond easily to any subjective state. A musical friend of the writer's reports that after accompanying a singer he is often hoarse, although he has not uttered a note. We must assume in such a case that during the playing of the accompaniment the pianist has been repeating in contractions of the vocal chords the movements made by the singer; and yet who ever recognizes all this to be true in his own experiences? The movements may become at times intense just because they are wholly unrecognized. It usually takes some careful observation, or even experimentation to convince the ordinary observer that he is constantly performing these movements. Again, take another illustration. If we place two bodies of exactly the same weight and general appearance, but of different sizes, before an observer, his past experience will lead him to believe that of these two objects the larger will probably be the heavier. As he thinks of the two objects, that is, as he forms his ideas of them, the muscles of his arms will, even before he touches the objects, prepare to lift the weight that he is naturally attributing to them. This muscular reacting will differ in the case of the two objects just as his ideas differ. For the larger body there will be a more intense muscular preparation, for the smaller body there will be less intense preparation. These facts of muscular preparation would under ordinary conditions be wholly overlooked, so vague are the sensations resulting from them. We generally think of the idea as formed without any reactions whatsoever, but it is never so formed. The way in which the muscular preparation can be brought to light is to allow the person after forming his ideas to lift the weights. He will now be confronted by a curious combination. The weights are exactly alike, the muscular preparation for the larger one is too great, for the smaller one too little. The larger one will, because of the excessive preparatory strain, go up very easily when he lifts it,

the smaller one will go up with difficulty. The result will be that the large one will seem lighter than the small one.

The experiment demonstrates clearly the fact that ideas are not only accompanied by reactions, but are accompanied by particular and appropriate forms of reaction. And it demonstrates with equal clearness that the importance of the reaction is not to be found in the sensory factors which the movement contributes to conscious experience. Experience is in this case definitely formed and contains motor factors even before the existence of these motor factors is known in any positive sensory way.

Or take even more general and direct investigations of sensations of movement. Thus, some very delicate adjustments are made by the hand; and these have often to be thought of as dependent for their accuracy on sensations of movement. An experiment in which the validity of this theory of arm movement as guided by muscle sensations may be tested is as follows: Close your eyes and let some one point your finger directly at a given object. Observe as carefully as you can the sensations that come from your arm and hand. After thus getting the sensations from your hand and arm, that is, the motor sensations, as clearly fixed in mind as possible, let the hand fall for a moment at your side, and then try to repeat the former position of the hand. A very marked error will result.

A similar experiment has been tried with the eye. Sit in a perfectly dark room and look at a point of light. Turn the light out after looking at it intently, and then try to keep the eye in the same position, or try to come back to the original position after rolling the eye away for a moment. Now turn the light on again, and it will be found that the eye has made a considerable error, just as in the last case the arm and hand failed to return to the original position. Indeed, it has been pointed out that a spot of light in a dark room cannot be watched for any length of time without observing that it seems to make movements back and forth. The movements are in the eye, and yet they are not recognized as eye movements; but because the eye is supposed to be stationary, the spot is interpreted as the moving object.

Another general fact bearing on this discussion of the value of sensations of movements is to be found in cases in which an animal or person is put through a certain process. Thus, if one takes the hand of a child in his own and traces letters for the child, or if the child traces letters and outlines over a transparent copy, he will have the movement sensation appropriate to the activity in question, but these movement sensations will continue to be exceedingly vague, and the educational advantage of being put through such movements will be very small.

The child begins life with what we recognize as an undeveloped form of bodily activity. A few well established instinctive modes of behavior, of course, show themselves early in life, but, for the most part, the movements of the child are wholly uncoordinated and diffuse in character. It should be noticed that the term undeveloped, as applied to the child's movements, is not synonymous with the term simple in the sense in which we ordinarily use the word simple. The moving of a single finger, for example, is from the point of view of adult ability a simple performance. It is simple because it involves relatively few muscles and because its consequences as they present themselves in the form of sensations of movements, or in the form of external effect upon the outside world, are relatively insignificant as compared with the result of a more extensive form of muscular activity. But if we think of this act of moving a single finger from the child's point of view, we shall see that in a very important sense it is far from simple. For the child to select the particular finger movements which must be executed from among the great mass of possible hand and arm movements is absolutely impossible. Such selection and such co-ordination as is required for moving a single finger is the result of a long period of development. We recognize this fact when we say that the child has no control over his bodily activities. We do not mean by control the mere ability to move, but we mean rather the ability to move in the specific appropriate fashion which we all recognize as indicative of individual power and development.

Starting with this wholly undeveloped stage of movement it is the business of education to bring the child to a state in which he shall be able to react appropriately to a great variety of conditions. In other words, development in its early stages aims very largely at growth in control of bodily activities. This bodily control is attained, not through conscious sensations of movement or conscious purposes clearly foreseen by the learner; but as soon as the approximate movement is selected from the diffuse mass and is cultivated by repetition until it becomes the established mode of action, it becomes the expression of the whole mass of experience which entered into it. A strong, well-defined bodily movement is not merely a product of development, it is also the means of carrying forward all the experience that has entered into it in a crystalized form. Movement becomes thus an important end for educational consideration. All movements record the kind of experience that entered into them. If this training is irregular and unsystematic the movements will be so also. A second important lesson is that physical training is not foreign in its purposes to all forms of training which prepare for life.

HOW TIME MAY BE FOUND IN THE CURRICULUM FOR ADEQUATE PHYSICAL TRAINING.

BY SAMUEL T. DUTTON,
Teachers' College, Columbia University.

The same question might be asked concerning any other subject now taught in our schools, and the problem is largely one of management and teaching. There is, of course, a vast difference in the conditions under which schools are conducted in various sections of the country. These are determined by the degree of helpful public sentiment prevailing in the community, the intelligence of directors and teachers, and the courage shown in living up to what is known to be truest and best. But I propose to take an entirely hopeful view of the situation. We are not still in the dark ages. We have no right to find fault with the progress that has been made toward a more hygienic and considerate treatment of children. The subject of physical education, for which this association is sponsor, has made remarkable headway in our large towns and cities, and there is every reason to believe that it will find its true place in the economy of modern education and life.

As I have looked over the literature of this subject I have felt that too much of it is written in a minor key. The specialists seem to be somewhat impatient because their theories and discoveries are not at once accepted and applied; but I venture to suggest that in very many quarters practise has kept pace with well established principles. Therefore, as I undertake to point out some means whereby the curriculum may be relieved and time be found for adequate physical training, as well as for other vital phases of education, I shall speak of matters that are by no means new and which are already recognized in our best schools.

First—There is to be a better selection and arrangement of the material which constitutes the subject matter of the curriculum. I met a clergyman a few days ago who told me that during the past summer he took his oldest son, a freshman in college, with him to Europe. He had himself made two journeys thither several years ago for a summer vacation, and had on those occasions, and when he was younger than he is now, done full justice to the American reputation for covering a large amount of territory in a short time. In fact, he had been to nearly all the European countries and all the larger cities. He said, "I have been suffering from great weariness for the past year, which is due to the fact that I was ambitious to have my son see in one vacation as much as possible of what I had seen during my two former visits." He added, "Not only did

I wear myself out, but I am sure now that it would have been much better for the boy if I had permitted him to travel more deliberately and to see fewer things." This important lesson, which tourists generally learn by experience, has been only partially acquired by the makers of courses of study. The field of human knowledge in its various departments is so immense that it is impracticable, in the elementary schools, to teach anything except the most central and representative truths. There is no good reason why we should undertake to do so. If education is growth, and if our attempts to render salutary assistance to nature in improving the personality, in developing power, and in enriching the life are made with a consistent aim and purpose, we need have little trouble in selecting those topics in every field that will be typical of the entire field and will permit such intensive study as to give the student correct habits of work. There will also be abiding interest which, according to Herbart and a host of others who agree with him, is more to be desired than the knowledge itself. If my friend had taken his son to one or two typical towns in each country, and had remained there long enough to permit him to enter into the history, the traditions, and the life of the people, to study their institutions, to learn something of their ideals and ambitions as men and women—in fact, to get into sympathetic touch with them in their daily vocations—and had pursued this method during his entire journey, he would not only have given him much nutriment for his future intellectual sustenance, but would have enabled him to form habits of investigation and research which are good for young or old, not only in travel, but in school, in the university and in real life.

Many of the courses of study, prepared with consummate pains and labor, present a bewildering and inchoate mass of material illogically arranged and of comparatively little value. More than this, there has been—and is to-day, I am sorry to say—in many quarters, the tendency to cling to quantitative standards. There can be no economy of time or energy under these conditions. A reform has begun, though it has proceeded but slowly. Such crowding, congestion and confusion as are seen in many curricula are distinctly opposed to those high ends for which physical education stands.

Closely related to this better arrangement of material is the plan not infrequently adopted now of having what is known as "rotation of crops." By this plan a less number of studies is pursued in a given term; arithmetic, history or geography is dropped for the time being, and the remaining studies are attacked with more vigor, so that pressure is relieved.

Second—Another means of instituting economy in the curriculum is through good teachers. I might have said through better

teachers; but I do not wish to imply at this stage that we have not good teachers in our schools. No doubt many of them might be better; but with a somewhat wide range of observation, I am glad to express the opinion that we already have a preponderance of good teachers. Under the right supervision (and I may add that we are making headway in that particular) the teachers of the country can do much toward the solution of this question. Good teachers are conscious, to a greater or less extent, of the true aims of education; they love children; they want to help them to grow up possessing all those qualities of the body, mind and heart that shall make them useful and happy. Good teachers know that interest and spontaneity are fundamental in the school life; they know that the motive force proceeds largely from themselves, and that what they are in temperament and disposition and character is reflected in their pupils. Good teachers will think more of the example they set, of the habits their pupils form, and of their ability to accomplish hard tasks, than they will of any formal standards either in subject matter or discipline. Good teachers are not frightened at the word "correlation." They know that it is a principle of every-day life in the school room by which pupils may economize time and labor and may possess themselves of a compact body of knowledge. Good and high-minded teachers rebel when an impossible curriculum is exacted, and when they are not given freedom to teach each class, and each individual in the class, as his needs require, for modern education is nothing if it does not permit differentiation and discrimination.

The New York merchant of to-day goes to his office at ten o'clock in the morning and remains there possibly for three or four hours, during which time he transacts as much business as his father or grandfather did in a month. His influence is felt by every one in the establishment; his methods are direct and positive; he wastes no words and accepts nothing but prompt and efficient service. By such forceful and clear-headed management he is able to accomplish his work by three o'clock in the afternoon, and can probably then go riding in the park. There is something to be learned by our teachers from the man of affairs. Economy of time and strength in education are in the direction of quality, not quantity, of hearty courage and enthusiasm, not hum-drum and weariness.

Third—And this leads me to speak in the third place of what may be accomplished by a skillful arrangement of the daily program. Each day's school life, as any kind of life, is a cross section which should present in its elements all that enters into the daily regimen to make it helpful, joyous and effective. And here I find a vast difference in schools. One is like a grist mill; first one grist is ground and then another, with little thought of variety,

or rest, or refreshment, while other schools never suggest weariness because of the happy arrangement of exercises. Here the skillful teacher is at a high premium. In elementary schools, at least, there should be interesting and pleasing variety. The young child's power of consecutive attention is limited, and it is wasteful to continue exercises after children have become wearied and inattentive.

The principles governing fatigue should guide the teacher in the arrangement of the daily work. Those subjects involving the greatest mental strain, as mathematics, languages, and possibly some phases of gymnastics, should be put into the earlier part of the day when the nervous organism is at its best. Following each exercise of this character, especially in the elementary schools, there should be brief periods given to matters that are more pleasureable and restful, as song-singing, games, stories, selections of literature, etc. The exercises which follow each other should be in sharp contrast, so that at least the mind works under a different tension or in a different way; thus interest is continued and the spirits of pupils are not permitted to become clouded.

Fourth—There can be no sound economy in the school life, and no proper, just claim can be made for physical education, unless the conditions under which the children live and work are in accord with well known hygienic rules. Fresh air, light, freedom from dust, and an agreeable temperature are prerequisite for a successful school. Physical exercises are of little use where the air is foul and where the children need nothing so much as to get out of doors into the pure air and sunlight. Furthermore, the best results, physical and intellectual, require that teachers should give serious attention to the home conditions of pupils and try to improve them when necessary. When home study is required, the question of how, when and where the studying is done is of supreme importance.

Practical educators are inclined to the view that medical inspectors should give much attention to physical conditions in the schools; that they should inspect the plumbing and test the air in the school rooms, as well as be on the watch for infectious or contagious diseases.

Fifth—And finally: The surest means of finding time for adequate physical training is to put into the curriculum an adequate amount of physical training. As Salmon P. Chase wrote to Horace Greeley, "The way to resumption is to resume." If it can be shown, and I believe it is being shown, that physical education properly applied in its corrective, developing and recreative forms results in a saving of time and energy, we are justified in taking such time as may be adequate for this purpose. But before speak-

ing specifically about time and methods of physical education, I desire to digress for a moment and recall to your attention certain familiar truths which have been often affirmed, but which are of such fundamental consequence that I cannot omit their mention here.

Physical training in its best sense is not the development of muscle, but the culture of the nervous organism. This organism is the seat and center of all human power and efficiency. It must have proper nutrition as well as health-giving exercise in its every part if the ends of true education are to be served. Hence it is seen that physical training per se is closely related to manual training and sense training. Physical training gives more attention to the larger groups of nerve cells and their corresponding organs and muscles, while manual training tends to secure finer coordinations with reference to executive efficiency. Sense training in its manifold forms, whether as an accompaniment of manual training or when directed solely to the exercise of eye and the tactual sense, operates to bring into service those portions of the nervous system which are of the greatest importance to the educated person. Thus nature study has infinite advantages in calling into exercise the perceptive faculties, in the storing of useful images, and the making out-of-door life full of attractiveness to young and old. To the interest in the things studied is added the joy and refreshment of varied activity. The gymnasium with its apparatus, however differentiated and complete, offers to young children nothing in physical culture that is comparable to a meadow of daisies or one thickly populated by grasshoppers and other interesting insects.

Professor Halleck, in speaking of the pleasure-giving powers of nerve cells, says, "To increase the strength and storage capacity of the nervous system, subject it to the proper exercise in as many varied directions as possible in youth. This exercise lessens the volume of nerve cells and leaves them in a state where rest and an increased assimilation of nutriment are necessary. Physiologists have demonstrated that more blood carrying nutritive materials flows to cells that are exercised than to those that are not. Herein lies an additional reason for early exercise of all brain tracts, sensory and motor alike, since they will thereby gain more nutriment and strength." This general statement is corroborated by many authorities who have written on the brain and the means of securing its healthy growth. I call attention to this phase of the subject in the hope that specialists in physical education will not narrow their field of interest to the gymnasium or the play ground; that they will enter into conference with teachers of manual training and science, with the definite aim of finding the close kinship existing between these several departments of education which so

directly affect the nervous system. The isolation of these fields of effort should not be pushed to such an extent that the devotees of physical training, manual training and science always meet by themselves and consider their subject as though it were the only one which has anything to do with the health and development of youth. Moreover, I must mildly protest against the assumption that the school, with all its appliances so complex and artificial, constitutes the only channel through which the young are to gain strong minds and healthy bodies. Professor Donaldson probably voices a profound truth when he says, "It appears probable that the education of the schools is but one—and that, too, rather an insignificant one—of many surrounding conditions influencing growth."

The change from rural to urban conditions, which has come to such a large portion of our population, gives, of course, increased importance to physical training as such. Nevertheless, I find from actual observation that city children are not idle while out of school. Parks, play grounds, vacant lots and streets afford opportunities for abundant and varied activity, and I am led to believe that city children, because of the limitations which affect them, develop a certain compensating ingenuity in regard to their sports.

Returning now directly to the question at issue, let me in conclusion ask first: What are the ends to be served by physical training, and how much time of the school day is needed to do justice to these ends? The things which a well devised system of physical culture can do and which are not sufficiently done by other school activities are: First, the correction of those faults which are due either to the postures assumed by the children in the home or the school, when sitting or standing, or those special defects which afflict so many children at the present time; second, there is the opportunity of securing a better development of the body and hence of increasing both bodily and mental activity. Recent experiments in a wide field, made by the Board of Education of Chicago through its child-study department, tend to show that the abler pupils at the same age are taller and heavier than those of less ability. The same results have been reached when measurements have been made in England and Germany. Putting side by side with this statement the records of increase in lung capacity and weight of pupils receiving adequate physical training, we have strong justification for its existence in our public schools. Both for correction and development, gymnastics must be organized, differentiated and refined to accomplish definite results. But in this direction we are confronted with a difficulty. Most school work is brain work. Fatigue is brain exhaustion. Complex and difficult gymnastics are no remedy for mental fatigue. They must

not be given when pupils are wearied with hard lessons, neither must they be continued for such a length of time as to make too heavy a drain upon the nervous organism. It follows that a good portion of the time given to gymnastics in all grades of schools should be employed in play and games and rythmic exercises taken out of doors when the weather permits, so carefully directed that all the pupils of the class may participate and may find a maximum of spontaneity and pleasure therein. I should like to put a blanket injunction upon every form of physical training that does not permit joyful exhilaration. The measure of the good teacher in every department, as has been before intimated, is his ability to call forth enthusiastic effort even in the performance of difficult tasks.

It remains to speak of the time needed for adequate physical training. Let me refer to one or two concrete instances. In a certain private school for boys, numbering five hundred, covering the entire range of primary, grammar and high school, there is a well appointed gymnasium in charge of a man who is characterized by much general intelligence and common sense. He is pledged to support the tenets of no system, but, using all available methods, aims to give to each class and each individual the training that he needs. Each class in the school is under his direction for fifteen minutes every day. Not a moment is lost. During those fifteen minutes there are forms of exercise which answer to the needs I have mentioned for correction, development and recreation. The school session is from nine to one. In addition to the fifteen minutes in the gymnasium, ten minutes at another point in the session are allowed for play in the yard, and twenty minutes for lunch. The gymnasium is also open in the morning for half an hour before school, and the instructor is present so that boys who desire to do so can come and exercise freely. Moreover, the school has a fine athletic ground, and I understand that the attempt is made to have as large a number as possible take part in the group and team work. While in this excellent school there is something to be desired in its limited attention to nature study and manual training, I believe that, all things considered, adequate attention is given to the physique of pupils, although it would not be possible to say this except for the good sense and skill which has enabled the instructor to economize the fifteen minute period to the best advantage.

In a certain system of public schools, where the session extends from half past eight to half past twelve for the primary and to half past one for the grammar pupils, twenty minutes are devoted to games and gymnastics at ten o'clock in the morning, and a recess of half an hour is given at eleven o'clock. No doubt good results are obtained with these conditions, but I believe, consider-

ing the ordinary length of sessions in public schools, that half an hour in each day is none too much for the various forms of play and gymnastic work desired.

I have tried to show that this adequate period of time may be secured by a more economic selection and arrangement of subject matter, by recognizing the potency of cheerful and enthusiastic teaching, by skillful program making with reference to the complementary relations of rest and fatigue, and by greater attention to physical conditions and the habits of pupils in both home and school work. I have also ventured to suggest that a partial answer is found to our query by using physical training in such a way as to conserve all those interests which center in the physical and mental life of the child and which tend to improve his spirits as well as his motive power.

Speaking as a layman and from the point of view of the general educator, I have called your attention to the interrelation of physical training with other phases of child life both in the school and without. Let me close by reminding my hearers that all teaching at its best is applied hygiene. While aiming to promote the ends of our own specialty, let us join hands with all those who are seeking through organized education to add nobility to the individual and to the race.

Guyau says: "The truth is that happiness is the most powerful of tonics." By accelerating the circulation of the blood it facilitates the performance of every function and so tends alike to increase health when it exists, and to restore it when it has been lost. The extreme interest felt by children in their games and the riotous glee with which they carry on their rougher frolics, are of as much importance as the accompanying exertion.

After an adjournment of fifteen minutes the meeting was continued in a larger room, when Dr. George Wells Fitz, M. D., spoke on "The Physical Examination of School Children."

THE PHYSICAL EXAMINATION OF SCHOOL CHILDREN.

GEORGE WELLS FITZ, M. D.,
Boston, Mass.

There is to-day a growing demand for the psycho-physical examination of school children, owing to the fact that experts have reached the point where they can, by the correlation of certain tests and measurements, determine in general the physical status of the child, estimate his ability to meet the demands of the school routine, and forecast to a greater or less degree his fitness for certain lines of work, besides correcting his deficiencies so that he is able more adequately to carry out this work. For the reason, however, that some of these studies do not yet rest upon so extensive a basis of carefully generalized data as to establish their results beyond question, as is for example the case with the studies on fatigue, it is essential that teachers should heartily co-operate in their further prosecution.

At the present time such co-operation is not in general being given, in spite of the fact that in a few places, notably Chicago, the studies made have already borne valuable fruit. The reason for this apparent lack of interest is chiefly to be found, I believe, in the scholastic prejudices and hide-bound regulations of school boards, committees, and teachers. The so-called regular work of the school, based upon a cut and dried system of mental attainment, requiring on prescribed subjects a given number of hours of study for a given number of days in each year of the child's school life, with an arbitrary and superficial examination as a final test at once of the child's attainment and of the teacher's efficiency, makes the introduction of any investigation a physical impossibility. This impossibility is, however, purely artificial, being in no sense inherent in a rational system of education.

To-day those who are most in a position to realize this fact, and, by bringing it home to the consciousness of all trainers of children, to take the place of reformers of our school system, are the physical educators. By their training and association they stand less in awe of the demands of scholastic prejudice and from the very nature of their work have a better opportunity to appreciate the importance of the physical well-being of the children. They are the opening wedge which the present school system is admitting to its ultimate regeneration. This regeneration is, however, not a matter of inspiration but of work which, from the very nature of

the reform attempted, must be laborious and painstaking, involving a mass of detailed observations the outcome of which, though perhaps often in doubt, shall be finally convincing.

The attitude of the past generation toward the child has been on the whole the simplest and easiest one. All children were regarded as exactly similar lumps of clay, to be squeezed into identical moulds, with the success or failure of the operation obvious at a glance. The new attitude demands that each child shall be considered as essentially and vitally different from every other child, striving for his own individual goal and demanding the individual means which shall best fit him to reach that goal. The would-be reformers of the present school system are, therefore, to-day confronted with the entirely new problem of determining the deficiencies and powers of each individual child. Although this problem, especially when contrasted with the previous formal examination of mental attainment alone, seems overwhelmingly complex, sufficient investigation has already been made to show that there are certain well-defined lines along which observations may be taken and generalizations made which throw immediate light upon it.

The fitting place for these examinations is, of course, the school, since it is the only point of continuous contact between the child and trained observers and since it affords the most economical way of reaching the large numbers involved. The character of the examinations should be uniform in order that comparable results may be obtained and the whole mass of data be made available for use. With this end in view I have prepared the following list of observations as a suggestion of what should be done:*

1. Name.
2. Date.
3. Age.
4. Weight.
5. Height, standing.
   sitting.
6. Girth of chest, natural.
   full.
   empty.
7. Girth of abdomen.
8. Lung capacity.
9. Strength of chest, pull.
   push.
10. Quickness.

*This should be considered a minimum list. For additional tests and descriptions of apparatus see "Experimental Study of Children," by Arthur Macdonald, in the Report of the Commission of Education, 1897-1898.

11. Accuracy.
12. Vision, R.
    L.
13. Hearing, R.
    L.
14. Other senses (including pain).
15. Endurance.
16. Pulse, at rest.
    after running.
17. Color of mucous surface.
18. Haemoglobin.
19. Condition (fat, etc.)
20. Development.
21. General health.
22. Diet.
23. Habitual postures.
24. Nervous tone.

The first eight items need no explanation.

The ninth, strength of chest in pulling and pushing, can be readily obtained by the use of the ordinary hand dynamometer,* and gives an index of the general muscular development.

Quickness and accuracy (10 and 11) can be most economically tested by determining the subject's rapidity and accuracy in dotting spots on a sheet of paper, fifty or one hundred dots being used.

The condition of the other senses (14), as of touch, taste, smell, etc., need not be determined except in the case of a dull child.

The test of endurance (15) by means of the ergograph has been shown to be of value and something of a standard has been established by the Chicago observations.** Ergographs can be cheaply constructed or easily obtained.***

The rapidity of the heart and its response to exercise (16) gives much valuable information as to its general condition.

The color of the mucous surfaces (17) should be observed, that the teacher's eyes may be trained to detect the pallor which accompanies poor blood.

The haemoglobin test (18) should be used in anaemic cases for corroboration of the above (17), and may be easily made by means

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*By means of cords and pulleys or a system of levers a very cheap yet effective substitute can be constructed by an ingenious teacher.

**Report of Dr. Christopher on "Child Study Investigation," in Annual Report of Board of Education, Chicago, 1898-1899.

***The Harvard Physiological Apparatus—Lord Electric Company, 81 Milk street, Boston.

of the method of Tallquist, in which the stain of a drop of blood on a piece of bibulous paper is compared with a color scale. This test, however, need not be made in ordinary cases.

The determination of the nutritive condition (19) of the child from an inspection of the subcutaneous fat and the general aspect of well-being, depends upon the directed observation of the teacher and not upon laborious tests.

Development (20) stands for a complex of conditions involving size, weight and physical maturity and also depends for its determination upon a trained judgment such as a teacher can readily acquire.

General health (21) involves a consideration of the following topics: Coughs, colds, headache, mouth breathing, nose bleed, constipation, diarrhoea, malaise, etc.

Under diet (22) should be considered the amount and quality of food taken, its nutritive value, distribution of meals, use of tea, coffee and other stimulants and of sweets and pastry.

The determination of the fundamental habitual postures (23) in standing, sitting, and sleeping is important as a basis for corrective training.

Nervous tone (24) may be tested by Warner's method for observing steadiness of fingers and eyes.

The records should be made on suitable cards so arranged as to give space for half-yearly observations throughout school life, and the cards should be passed on with the child from grade to grade that at all times a history of the child's condition may be available.

The above outline includes two classes of observation, the one furnishing data immediately available for practical application to the child, the other giving material for generalization which, when submitted to expert analysis, may prove to be of great value. These latter data suggest the advisability of the establishment of a commission of experts to whom they may be submitted and by whom directions for uniform investigation may be promulgated.*

To the teacher as such, this work is of inestimable benefit, for it sharpens her observation, trains her judgment and brings her into close and helpful sympathy with each and every pupil.

This last paper was discussed by Mr. Nils Bergquist and Dr. Maximillian Groszmann.

Mr. Bergquist said: "What is theory without practice? While I agree that these tests will be fine, how are we going to get time to make them, and who shall do it in a city of 100,000 school children? Tests were made in the schools of Stockholm some

*The Bureau of Education at Washington, through its expert, Dr. MacDonald, has already done so much valuable work in practical child-study that it would seem fitting for our Association to co-operate with it in its investigations.

twenty-five years ago by physicians for scientific purposes. I have examined those children in the Brookline schools who appeared to me deficient, and to these I gave special treatment in the way of exercise."

Dr. Hastings, Springfield, Mass., Y. M. C. A. Normal School, said: "We have examined children in Omaha and Lincoln, Nebraska, at the rate of two or three children a minute. It is possible to examine a school of 300 children in two hours. These measurements were, of course, the smaller group which are the most practicable." Mr. Hastings explained that this rapid work was accomplished by means of eight examiners working at the same time, and having the assistance of eight recorders. One hundred and fifty children were examined in this way in one hour, they passing in line before the examiners.

Mr. Lawrence told how in the Horace Mann School a thorough examination of each child was made, including dressing and undressing, the whole time not occupying more than fourteen minutes.

The meeting was adjourned.

SECTION ON NORMAL SCHOOLS.

Fayerweather Hall, Room 615.

J. W. SEAVER, M. D., CHAIRMAN,
Yale University.

The meeting was called to order with Dr. Seaver in the chair. Miss Hopkins was appointed secretary.

The meeting was opened by Dr. Seaver with a paper entitled,

A PLEA FOR MORE THEORETICAL INSTRUCTION IN OUR NORMAL SCHOOLS OF GYMNASTICS.

BY J. W. SEAVER, M. D.,
Yale University.

The problem of physical education to-day is vastly different from that in the past. The work has not yet grown into a science but it is moving towards scientific accuracy by constantly improving methods. The great purpose of gymnastics fifty years ago was to serve as a safety valve for the exuberant vitality of the few; to-day, let me try to indicate its leading object as the upbuilding of the vitality of the masses, with special regard for the weak, and only casual consideration for the strong.

In a certain sense, physical training was formerly destructive in scope; to-day it is constructive. When surplus energy was to be used up, the method employed was one of bruising, and the "bruiser" was employed to do the work. When impaired vitality is to be restored, the method of the physician must be employed and so the doctor has been called in to take charge of physical training in many of our important schools and colleges. As professional skill has been sought, technical schools, laboratories and accessory institutions have been called into life, until to-day the Normal School of Gymnastics stands forth as the highest product of the evolution of the modern idea of physical education.

Just what the normal school shall be in the future will be determined by the needs of the people. To-day, it is the professional training school of the teachers who are to do for the next decade the best that they can do for the physical uplifting of our people. What do we want these schools to teach? Or, in other words, what kind of a product do we want them to put forth? For the public is only interested in the teacher and not in the method of producing that teacher.

We are here to study the methods of training teachers for the great public. We are the manufacturers who are trying to improve methods and processes and products, and to educate the public to demand the best that can be turned out. There are about seven normal schools of physical education which are trying to meet the demand for teachers, and at least half of these are located in Massachusetts, which is rightly entitled to a leadership in any educational movement. A glance at the circulars issued by these schools and a comparison with those issued ten years ago impresses one with the fact that there is a distinct movement towards the enlargement of the curriculum in the direction of the so-called theoretical branches of study, and this enlargement shows not only a broadening, but a decided deepening of the work, until the amount of mental application required in these schools is vastly in excess of the physical.

This I believe to be a healthy indication, but I beg you to notice that the popular appreciation of gymnastics has grown faster than the curricula of the schools, until to-day the best positions are filled by physicians who have had ample preparation along certain theoretical lines, but whose training is decidedly uneven and constitutes a bold landscape made up of sturdy hills seamed by yawning chasms of ignorance that indicate an earthquake or cataclysm somewhere in their preparatory course of training. This should not be the case. The physician does not leave his office to fill a pulpit, although this might temporarily help the somewhat diseased condition of theology to-day; nor does he step from the clinic to the school room, for he has had no training as a teacher. Why should he crowd the teacher of gymnastics from the best positions? The answer will give strength to my plea for more theoretical instruction in our normal schools.

Every graduate goes forth with a sufficient complement of movements that if properly employed would move the world, but unfortunately, the knowledge of when to employ certain exercises and when to use others, rests on so narrow and empyrical a basis that it topples over and crushes the teacher very frequently, and it ought to obliterate him oftener than it does. The remedy for this must be found in giving the pupil who is preparing for teaching gymnastics, as thorough and complete instruction as is furnished in the medical schools of the country. This is not an impossibility, although it looks toward the endowment of such schools by friends of physical education or by the state. Until such conditions can be obtained, I beg to suggest that an alliance should be formed by each of these schools with some medical school, so that the instruction should be made as thorough and inexpensive as possible.

As a fundamental requirement, all pupils should be required to

have at least a high school education before beginning their technical training, and this high school course should be, if possible, along the lines of natural sciences rather than in the classics, as a familiarity with the conditions of every day life seems essential in this line of work. As few high schools give more than a slight theoretical knowledge of chemistry, and since chemistry is destined to play a constantly increasing role in the interpretation of physiological facts, and even in domestic life, it is absolutely essential that each pupil at the beginning of the course should have a practical knowledge of fundamental reactions as evidenced in chemistry. This course should cover at least twenty weeks of the first year, of eight hours per week, and should precede any instruction in pure physiology.

Coincident with the course in chemistry, instruction in the use of the microscope in the study of low forms of life, both animal and vegetable, should be given; and this may be considered the preliminary step in the study of biology, which should be continued for at least twelve weeks of six hours a week, and should lead to the further use of the microscope in the study of microscopic anatomy, or, as it is termed, histology. I would be willing, if necessary, to sacrifice all instruction in human physiology during the first year of the course if thorough instruction could be given in the subjects indicated. However, I believe it is wise to begin the study of elementary physiology by the opening of the second half of the junior year.

The work in anatomy, already given, should be extended by work in dissection, for in no other way can anatomical information be dissociated from the text book and made applicable to the human body. This dissection should properly come in the second half of the junior year; and the work should aim more at a thorough comprehension of the mechanical conditions displayed by the muscles and bones rather than a study of them separately. Attention must be paid to the position and relationship of the nerves and great blood vessels, for a knowledge of them will be essential in determining the actual value of exercises as applied to various individuals. (Note the discussion of Swedish Physiology in our Review last year.)

This work in anatomy should be continued during the first half of senior year by practical applications of its principles to the problems of physical training, thus supplementing a course in the physiology of exercise.

The course in physiology should begin with the second half of junior year, and be continued for at least three exercises per week during the remainder of the course.

Instruction in anthropometry should be given during the first three weeks of senior year, by lecture or recitation, and I believe

that not over ten hours should be devoted to this topic in a theoretical way; and I am not inclined to believe that much time can be profitably spent on the history of the subject, certainly not more than two hours.

A course in medicine pays no attention to the history of the art as practiced by the fathers of the profession except in casual references; so in this course time is too short to be spent on matters of general information, however interesting they may be in themselves. I would much prefer that time should be spent in the practice of anthropometry, that alone will give accuracy and confidence in the work, rather than that it should be spent in extending the information that may be gathered from books at any time when it is desirable.

I beg to suggest that the only way that this subject can be taught is by requiring the pupil to actually measure and test the same person repeatedly and then to compare the records. This will show their tendency to error and permit corrections in method to be made. It also seems advisable that each pupil should undertake some independent study, like the variations in the size of different parts of the body produced by exercise, etc.

The subject of strength tests is, I believe, a fruitful one for any person to investigate; but the pupil should not be encouraged to investigate too many points. In fact, the same may be said regarding any other department of anthropometry, for we take many more records than we study and use.

The theory of gymnastic movements should properly be extended through the whole course, and I am fully convinced that much time is spent on the mastery of elaborate movements that might more profitably be spent on a discussion of the physiology involved in the exercise and the relation of one movement to another.

The acrobatic ideas cannot be eliminated from the minds of some of the older directors of gymnasia and we must look to you younger teachers for a new standard and a keener appreciation of our true mission in life.

It must be admitted that in this country we have not developed any standard theory of gymnastics; and there are comparatively few points on which the so-called "leaders in gymnastics" are agreed. This unfortunate fact will explain the delay that has occurred in adopting some form of gymnastic exercise as a part of the school curriculum in many cities where both superintendents and school boards are agreed that some form of physical education is desirable if not absolutely essential. The lack of thorough training in the lines of our professional work, and the consequent necessity of each teacher occupying the position of a pioneer in the work, explains this lack of agreement and has notably de-

layed scientific investigation as to the best methods of physical training. We have a surfeit of personal opinions, personal methods, personal systems and patented machines. We can be taught that the gymnastic earth is round or that it is flat according to the price we are willing to pay for the instruction. It will only be when we study the human body with respect to its actual needs and its response to various exercises and conditions that we shall ever work in harmony and thus make every effort tend to the advancement of the cause in which we believe, and to which our life's work is given, independent of personality.

This paper was interrupted for lack of time and the report of the Committee of Nine was called for.

REPORT OF COMMITTEE OF NINE.

This committee was called into being by the following resolutions offered by the New York delegation at the First National Convention at Boston, 1899.

"Whereas, We believe that the interests of physical education in this country require a high standard of excellence, with one and preferably two years of special preparation of the teacher, and that the influence of this association should be exerted toward this end, therefore, be it

Resolved, That the American Association for the Advancement of Physical Education shall at this convention appoint a committee with membership sufficiently large and representative of the many scattered societies and various phases of the subject of physical education, which shall thoroughly investigate and report to the next convention:

(1) A rational and efficient curriculum of studies necessary for one intending to teach physical education in schools, colleges, etc., in this country.

(2) The courses now offered at the various schools, colleges and other public and private institutions in the country, where normal training in physical education is given, with a view toward officially recommending such as prove to be adequate; and,

(3) Conduct such examinations, theoretical and practical, for such candidates as may desire it, on such subjects as the committee may deem a part of the necessary equipment of the teacher of physical education, with the view of issuing a diploma of the American Association for the Advancement of Physical Education to such candidates as have passed satisfactorily."

Your committee has considered these resolutions and desires to offer the following recommendations:

(1) That the admission requirement to normal schools of physical training shall be a high school education or its equivalent.

(2) That prospective candidates for admission shall be recommended to select especially such courses in preparation as physics, chemistry, mathematics and biology (botany and zoology).

(3) That average health and strength shall be required of prospective candidates for graduation.

(4) That previous training in gymnastics is desirable.

(5) That candidates for admission to normal schools of physical training be required to furnish satisfactory endorsements from at least two persons, as to moral character and general fitness, preferably from the last teacher and from the pastor or some responsible business acquaintance.

(6) That pupils shall not be admitted under eighteen years of age.

(7) That normal schools of gymnastics admit all pupils on probation.

(8) That a two years' course of study and training of at least thirty weeks' duration each year, shall be considered a minimum preparation for teaching physical training.

(9) That a three years' course should be considered desirable for teachers of physical training.

(10) That the minimum training for teachers of physical training should be extended to three years of thirty weeks each as soon as practicable.

(11) That the following curriculum be adopted as a minimum requirement for normal schools of physical training:

Music and voice training, 45 hours.
Physics, 30 hours.
Chemistry, 60 hours.
Anatomy, gross and microscopical, 90 hours.
Physiology, 90 hours.
Physiology of exercise, 90 hours.
Animal mechanics (general kinesiology), 45 hours.
Personal hygiene and emergencies (first aid), 45 hours.
Anthropometry, physical examination and diagnosis, prescription of exercises (theoretical part), 90 hours.
History of physical training and theory of physical training (special kinesiology), 100 hours.
Pedagogy and psychology, 90 hours.

FOR A THIRD YEAR.

General massage, medical gymnastics and clinical applications of same, 180 hours.
Pathology, 45 hours.

Advanced physiology of exercise and experimental physiology, 100 hours.

School government, 12 hours.

The committee further recommends:

(12) That 25 hours per week be devoted to the theory and the practise of gymnastics.

(13) That the theoretical work should occupy 12 hours per week.

(Adopted to this point.)

(14) That the association give to candidates who satisfy requirements cited hereafter, certificates of proficiency as teachers of physical training of the following grades, viz.:

(1) Instructors of physical training.

(2) Masters of physical training.

(15) That these certificates be granted either by the National Council or by a board of examiners appointed by the National Council, such board to be composed of seven members, five members to constitute a quorum and a two-thirds vote to be necessary for acceptance of candidates.

(16) That graduates of such normal schools as fulfill the minimum requirement set forth in these recommendations shall be eligible for the instructor's certificate, provided satisfactory examination questions and answers and theses of the last year of the course, together with the course of study, are forwarded by the normal school for such candidates.

(17) That teachers who have successfully taught physical training for five years be also granted the instructor's certificate.

(18) That candidates for a master's certificate shall present, in addition to the requirement for the instructor's certificate, three years of successful service and a minor and a major thesis representing two lines of original work pursued by the candidate, the minor thesis to be of at least three thousand words and the major of at least eight thousand. If a candidate prefers he may present the minor thesis at the end of two years instead of three.

The third year of a three years' normal course of study, or a year of graduate study at a normal school, shall be considered as equivalent to two years of practical work in the requirement for the master's certificate.

(19) That at the discretion of the Council or the board of examiners teachers of well known preparation and attainment shall be granted degrees on application without special examination.

The following list of gymnastic exercises, games, etc., is reported by the committee for publication without recommendation:

I. Marching—Tactics, figure marching, maze running, fancy steps, dancing, running.

II. Light gymnastics (calisthenics)—Free exercises, wooden dumb-bells, iron dumb-bells, Indian clubs, wands and bar bells, rings, hoops, poles, balls, etc.

III. Heavy gymnastics—Parallel bars, suspended bars, horizontal bars, vaulting bars, Swedish boom, side horse, long horse, buck, flying rings, traveling rings, ladders, ropes, climbing poles, chest weights, stall bars, mat work, tumbling, pyramids, Roman ladders, see-saw (balance swing), balancing board, giant stride, bouncing board (spring board).

IV. Combative exercises—Boxing, wrestling, fencing-foils, single stick, saber (broad sword), French cane, bayonet, quarter staff, dueling sword.

V. Athletics—Track sports, walking, running, hurdling, bicycling, field sports, high jump, broad jump, pole vault, putting shot, throwing hammer, discus, javelin.

VI. Games—Indoor team games: Basket ball, indoor base ball, battle ball, pin ball, volley ball, potato race, other games, indoor gymnastic games.

Outdoor games: Foot ball, Rugby; foot ball, association; base ball, field hockey, lacrosse, cricket, golf, tennis, Minton, archery, cross country running.

VII. Aquatics—Rowing, fixed seat; rowing, sliding seat; paddling, swimming, diving, water polo, water base ball.

VIII. Ice sports—Skating, ice hockey, curling, skeeing, snowshoeing.

G. W. FITZ (Chairman),
E. H. ARNOLD,
(LOUIS COLLIN),
CHRISTIAN EBERHARD,
J. H. M'CURDY,
(E. M. HARTWELL),
GEORGE L. MEYLAN,
HOPE W. NAREY,
BARONESS ROSE POSSE.

April 5th, 1901.

Miss Homans opened the discussion by emphasizing the necessity of the probation of high school graduates and also indorsed the enrichment of the curricula as proposed by Dr. Seaver.

Dr. Arnold voiced this idea also and proposed two school years of four periods each, in place of a three year's course. Dr. Arnold also said that the proposed course of study was a compromise.

Dr. Truslow also emphasized the need of enrichment and was followed by Dr. McCurdy, who urged the need of a better basal training, especially along the line of personal hygiene.

Mr. Bolin gave as his opinion that anatomy and physiology should be taught from the standpoint of applied science rather than from that of the physician. He advocated the curtailing of instruction in formal anatomy. Mr. Bolin believed that the applied sciences, such as chemistry and physics, should be taught by gymnasts rather than specialists, but added that he knew only one person capable of doing this.

Baroness Posse replied that the teachers in the Posse School were graduates of that school and thus able to give this instruction properly.

Dr. Arnold agreed with Mr. Bolin that applied subjects should not be taught by specialists. He believed that pedagogy should be taught in practical lessons, thus saving time.

Dr. Bowen of the Ypsilanti Normal School said that graduates of physical training schools do not touch the masses directly, but through the grade teachers. He emphasized the need, then, of greater effort to introduce into state normal schools abbreviated courses in both theory and practice.

The discussion was interrupted to call for Dr. Truslow's paper, to accommodate those who could not remain until the close of the meeting.

The subject of the paper was "A Method of Recording and Charting Cases of Scoliosis." The paper was illustrated by a living model.

A METHOD OF RECORDING AND CHARTING CASES OF SCOLIOSIS.

BY WALTER TRUSLOW, M. D.

President Physical Education Society, New York City and Vicinity.

This paper deals with a method of recording cases of structural deformities of the trunk, which is in no sense new, but which is presented because of its simplicity and because by its use reasonably exact data may be found for estimating the amount of anatomical change present, and noting further changes, of improvement or otherwise, under treatment.

The deformities of lateral curvature of the spine are usually found in all three dimensions of space, and may include, as well as the lateral deviations, single or multiple, an accentuation of the normal curves in the antero-posterior plane, and vertebral and rib rotations in the horizontal plane, with their attendant asymmetries of the head and extremities. The lateral deviations may give rise to a lateral tilt of the head, a tilt of the shoulder transverse-line, making one shoulder habitually lower than the other, a space between the chest wall and the arm perceptibly greater on one side than the other when the arms hang, and a marked side sway of the trunk on the pelvis, giving the prominence and so-called "high" hip on the side away from which the body sways. The accentuated antero-posterior curves give rise to a forward drooping head, the abducted scapulae of round shoulders, protruding abdomen and abnormal inclination (antero-posterior) of the pelvis. And to the rotations of the vertebrae, greatest at the point of greatest lateral deviations, may be traced the rotations of the ribs and consequent posterior prominences and scapular protrusions on the side of lateral deviation and the anterior prominences of the chest wall on the opposite side.

The ideal record would register all of these deviations at one time. I know of no method of obtaining this except in the plaster of paris model, made from a plaster cast of the body, and the very elaborate scoliometers of Schulthess, Zander and others; but these are expensive and troublesome. We are therefore forced to take measurement in the three planes separately.

The following devices are recommended for their simplicity, inexpensiveness and fair degree of accuracy. The necessary apparatus includes a roll of surgeon's adhesive plaster two inches wide, a lead-tape line, a linen or flexible steel tape measure, a straight ruler about eighteen inches long, a colored pencil and some sheets of Manila paper or a tracing book in which to transcribe the records.

The deformity is one essentially the result of the upright position, therefore the observations and measurements should be made in the upright position. *Bradford writes: "When the patient is upright, either standing or sitting, it is almost impossible to obtain at two different sittings, precisely the same vertical plane or position of the axes of the thorax and the pelvis." He would have the patient prone, placing the mesial anatomical structures coincident with a line drawn on the table. In this corrected position the measurements and tracings would be made. But as it is desirable to know the asymmetries while in the habitual positions, it seems reasonable to take the measurements under these conditions and to use all care possible in overcoming personal errors.

The patient is stripped to about the level of the trochanters of the femur and stands with the back exposed to the examiner. The use of a front protecting apron, tied by narrow tapes at the neck and waist, overcomes the sense of impropriety in girls. A strip of adhesive plaster is placed over the vertebral column from the seventh cervical to the first sacral spine (the spine felt immediately below the transverse line drawn between the two posterior superior spines of the ilium). Gently smoothing this down with the hand, the plaster is made to adhere over every spine in the dorsal and lumbar regions. The fingers of the left hand form the guide, while with colored pencil the position of each successive spine is marked on the adhesive plaster. Before the plaster is removed from the back the level of the tips of the scapulae are marked on the corresponding margins of the adhesive plaster, also the transverse line between the posterior superior spines of the ilium is drawn to record any possible lateral tilt of the pelvis. The strip of adhesive plaster is now transferred to the sheet or book on which the records are to be kept. With the straight-edge ruler a line is drawn on this tracing, between the position of the seventh cervical and the first sacral spine. The amount of deviation in centimeters is easily measured. It is the distance from this line to the farthest removed dot on either side.

To take a tracing of the antero-posterior deviations the lead-tape must be not too malleable, because it is pressed against the body, and, in being transferred to the recording sheet, must not lose the body-contour, which it is to register. To get the antero-posterior contour the tape is unrolled and placed against the spine between the two vertebrae above noted; it is removed, turned on its side on the recording sheet, and its contour traced by the blue pencil which gently follows the lead-tape while it marks on the recording sheet.

To note and register the amount of posterior or horizontal-plane deformity of the ribs, the patient bends the body forward and

*Trans. Am. Orth. Ass'n., 1891.

assumes the Adams' position—body arched, head and arms hanging limp from the body and knees straight. The suspended position of the arms abducts the scapulae, uncovering the posterior chest and markedly exposing the asymmetrical protrusion of the ribs, which is a pretty exact index of the amount of vertebral rotation. This protrusion and rotation is recorded as follows: While the patient is thus bent over the lead-tape is pressed transversely over the back at the level of the greatest posterior deformity. (Adams took this always at the level of the tips of scapulae, whether that level coincided with that of the greatest deformity or not.) The ends of the lead-tape reach around until the position of the anterior border of the latissimus dorsi muscle is felt on either side. The tape is carefully transferred to the recording sheet, turned on its side and the line representing the posterior deformity is transcribed. If there is marked horizontal-plane deformity in front, a similar tracing can be taken of the front of the chest, although it is difficult to get any limiting landmarks such as the anterior borders of the latissimus dorsi muscles, which become obliterated when the bent-over position ceases. In a similar manner the abducted scapulae or unevenly rounded halves of the shoulder-girdle may be recorded by moulding the lead-tape against the scapulae at the levels of the spines of these bones and transferring the outlines to the recording sheet.

The tracings with the lead-tape are much more open to error than are those with the adhesive plaster, and the latter fails in extreme cases, but all are helpful guides, and as the lateral deviations taken in conjunction with the spinal height are good indices of the other two conditions, we may perhaps ignore the lead-tape tracings of antero-posterior and of rotation deformities in our calculations as to progress under treatment, although the pictures are interesting and impressive when shown to the patient or friends.

It only remains to show what practical use can be made of the measurements of the lateral deviations above referred to, and how they may be of value in helping our prognosis and determining whether treatment is efficient.

In my clinical work I have been in the habit of adding together the amounts of deviation to the right and to the left, in a given case, and calling that "total deviation." I then write down a fraction whose numerator is the figure representing the total deviation and whose denominator is the figure representing the distance between the seventh cervical and first sacral vertebrae, or the "spinal height." Dividing the numerator by the denominator gives a decimal fraction which might be called the "index of lateral deviation." Thus, in the case of a certain patient, 2.5 cm. is the dorsal deviation to the right and .6 cm. is the lumbar deviation to the

left, and 49.8 cm. is the spinal height. The fraction then becomes $\frac{2.5+.6}{49.8}=.0622$, which is the index of lateral deviation.

To show how these fractions aid in prognosis and in treatment, let me relate the history of this case:

Miss H. came under my care in April of last year. I found her lateral-deviation-index to be .0622. I had not been using these indices long, but having already learned to consider a figure so high as .06 or six per cent. as prejudicial to unaided improvement, advised a temporary support in the form of a spinal brace to supplement the active gymnastics which I proposed giving her. She was, however, extremely adverse to wearing a brace and agreed to work hard at exercise. She had gymnastic treatment at the office three times a week and took daily home body-building exercises. Her work was faithful and the next tracing at the end of May showed a lateral-deviation-index of .0540 or five and one-half per cent. This by June 15th had been reduced to .0509 or five per cent., and by July 31st to .0253, or two and one-half per cent. The treatments at the office were stopped during August and September, and when she presented herself in October the index was .0461, four and one-quarter per cent., or a partial relapse. Under renewed treatment that was receding again until the patient's removal from this city took her away from my care. Now, if the first tracing taken after treatment had commenced had shown any increase, as it did in another case I had, I would have insisted on the temporary brace or plaster jacket.

SUMMARY.

Accurate measurements taken at intervals afford valuable help in prognosis and treatment of lateral curvature of the spine. Measurements and tracings should be taken with the patient in the upright position, because only thus can the full extent of the deformity be shown. Simple, inexpensive tracings may be taken in the three planes of deformity. Lead-tape line and surgeon's adhesive plaster are the principal articles necessary. A fraction whose numerator is the total lateral deviation and whose denominator is the spinal height and which, when reduced to a decimal fraction or percentage, is taken as an "index of lateral deviation," is used to aid prognosis and determine progress under treatment.

Dr. Seaver opened the discussion by stating that corrective work was an essential part of the training of all teachers.

Questions were asked by Dr. Collin and others, after which Dr. Seaver renewed the discussion of the report of the Committee of Nine.

Dr. McCurdy called attention to Recommendation 19. He thought if this passed it was useless to give any consideration to courses of study in the normal schools.

Miss Homans suggested that consideration be given to all the recommendations up to and including Recommendation 13, but she considered that the remaining recommendations would be detrimental if passed.

Baroness Posse did not think the report as a whole good, but thought that persons not graduates of normal schools should be allowed on examination.

Dr. Seaver thought this might be possible in future but present chaotic conditions did not admit of it.

Dr. McCurdy made a motion, and it was seconded, that under present conditions it was unwise to push any part of the report. The motion was carried.

Dr. Seaver asked what would bring about unity among the normal schools.

Miss Homans thought that it would conduce to unity and stimulate a stronger and healthier feeling in the schools if each of the normal schools announced in its yearly catalogue the number of hours given to each subject and the name of the instructor.

Dr. Mulliner said that this course was pursued in the medical schools.

Dr. McCurdy said that Miss Homan's suggestion would lift the grade of work and insure progress. He moved that it was the sense of the meeting that all normal schools of physical training and all state normal schools giving a course in physical training to persons preparing to teach should print a full statement of the course of instruction and the hours devoted to each subject. The motion was supported and carried.

Miss Homans then requested Dr. Seaver to give his idea of the value of summer schools for students that had not received previous instruction in physical training.

Dr. Seaver replied, upholding the work of these schools with much force and clearness.

Dr. McCurdy stated that the Association Training School in Springfield gave up its summer school because the management believed the results to be detrimental to the cause.

After this there was a discussion of the rules of basket ball for women. After the discussion it was moved to recommend the Association to endorse the rules for basket ball for women arranged by the committee appointed at the Springfield Conference of which Dr. Foster was chairman. The motion was supported and carried.

Luncheon was served at Columbia University.

AFTERNOON SESSION—3 P. M.

GENERAL MEETING.

Columbia University, Schermerhorn Hall.

The meeting opened with an address of welcome by Dean J. Howard Van Amringe, Ph. D., LL. D.

The following paper was then read:

THE EFFECT OF MAXIMUM MUSCULAR EFFORT ON BLOOD-PRESSURE.

BY J. H. McCURDY, M. D.

Reprinted from the *American Journal of Physiology*, March 1, 1901, Vol. V., No. 11.

(From the Laboratory of Physiology in the Harvard Medical School.)

The teaching of gymnastics, now of such importance in education, can hardly be said to rest upon a sound basis of physiological knowledge. Even the effect of exercise on the blood-pressure, obviously one of the first problems to be considered, has not been determined with sufficient precision. A study of the effect of exercise on the blood-pressure should begin with the selection of one of the forms of exercise in common use by physical trainers. The observations should be repeated upon a number of individuals sufficient to exclude personal idiosyncrasy. Each individual should be observed often enough to make sure that a true record is obtained. Above all, the measurement of arterial pressure should be made during the exercise, as the maximal pressure is not maintained more than a few seconds. For this reason, methods which require the adjustment or manipulation of apparatus during the observation are unsuited to this work. Measurements after the muscular effort do not show the blood-pressure during the effort. So far as I am aware, none of the investigations hitherto made in this field satisfies these indispensable conditions.

Types of Exercise.—Teachers of gymnastics recognize certain well defined types of muscular exercise.

"Exercises of speed" are those in which the individual movements follow each other with great rapidity. Each individual effort is necessarily far less than the maximum effort possible to the group of muscles concerned. Exercises of speed may be divided into those of local character, for example, piano playing, and those of a general nature, as sprinting.

"Exercises of endurance" are characterized by long-continued moderate endeavor. They also may be local, as in the file-cutter's trade, where the muscles of the arm and shoulder are used almost continuously, or they may be general, as in mountain climbing or long-distance swimming, which require the relatively moderate contraction of large groups of muscles during long periods.

"Exercises of strength, or effort" demand great muscular exertion for a very brief period. In these the glottis is closed at full inspiration and the chest walls fixed, in order to give a suitable support to the muscles of the trunk. Good examples of such exercises are wrestling and the lifting of heavy weights.

Previous writers have shown that not too vigorous general exercise, i. e., a mixture of several kinds of exercise, will raise the blood-pressure. Knowledge of the changes in blood-pressure and other functions during each of the different kinds of exercise is now required. The present investigation deals with the alterations in blood-pressure during "exercises of strength, or effort."

Method.—It was thought better to select one clearly defined, typical exercise of strength, rather than to attempt the study of the blood-pressure in a variety of movements. The exercise selected was a combination of the back and leg lift used in the physical examination of most college students. The subject stood with bent knees. With the left hand he grasped the middle of the dynamometer handle, either end of which rested on the front of the thigh. At the word, he extended his legs and straightened his back, with all his strength. From three to five lifts were necessary to determine the highest blood-pressure.

The blood-pressure was measured with the sphygmomanometer. The instrument employed in this research was a modification of that used by Hill and Riva-Rocci. It rests in principle upon the fact that the pulse may be obliterated in any artery not possessing too free anastomoses by subjecting the artery to an external pressure equal to the blood-pressure in the artery at the point of compression added to that necessary to compress the tissue surrounding the artery.

A hollow arm tube of thin, flaccid rubber, 4 cm. wide, and 7 mm. inside diameter, was made from the inner tube of the tire of a racing bicycle. The interior of the tube communicated by means of a bicycle valve stem with a pressure bottle suspended from a hook five meters above the floor. The arm tube was covered by an inelastic casing of leather (raw-hide) 36 cm. long and 9 cm. wide. Ordinary shoe hooks were fastened to the leather, so that the band could be brought closely round the smallest arm and laced into position as a shoe is laced. The arm tube was applied closely and evenly to the arm, with the upper border touching the beginning of the deltoid enlargement. It remained in position without being

bound tightly enough to interfere with the venous circulation. The tube leading to the pressure bottle was clamped near its connection with the arm tube and the pressure bottle then raised to a height sufficient to obliterate at once the pulse in the arteries distal to the arm tube. The pressure usually made was 200 cm. of water. The clamp was now quickly removed, and the bottle lowered until the radial pulse, which had disappeared when the pressure was made, was perceived to be just returning. During the last part of inspiration and the first part of expiration, the pulse returned at somewhat higher pressure than at other times. The number of heart-beats which could be counted during the muscular effort before the pulse disappeared varied from one to four. The pressure fell in a few seconds after the beginning of the lift because the subject could not longer maintain his maximum muscular effort, i. e., as the tension of the dynamometer spring decreased and the amount of work accomplished by the subject grew less, the arterial pressure fell. This made it necessary to lower the pressure bottle to record a new pressure level.

Sources of Error.—When the sphygmomanometer is applied to any artery force must be employed to compress the tissues surrounding the artery. In the case of the radial artery Von Basch estimates the force required at 6 to 8 mm. Hg. The occlusion of the empty artery requires a pressure of from 1 to 5 mm. Hg. He calculates that changes in the relation of the radial artery to the bone and tendons caused by accidental movements of the hand or fingers may introduce an error of 20 to 60 mm. Hg. Finally, the error of observation in determining when the artery is actually occluded may amount to from 1 to 5 mm. Hg. Some of these errors may fairly be excluded when Hill's instrument is applied to the upper arm. In this position the relation of the artery to surrounding parts does not change materially. It would then seem fair to limit the errors to the occlusion of the artery, the compression of the surrounding tissues, and the errors of observation. These would make a total of from 8 to 18 mm. Hg. To this would be added the pressure lost in stretching the tube encircling the arm, but the friction here is so great that for all practical purposes the tube is inextensible, and the error from this source may therefore be neglected. Hill affirms that when the tube is placed around the upper arm the only material error is one of observation, and he limits that to 5 mm. Hg. Hill finds in experiments on dogs that when the tube is placed around the neck, the readings are identical with those taken simultaneously from the femoral artery connected directly with a mercury manometer. We may believe, then, that the readings taken in the present investigation are at the most not more than 20 mm. Hg. greater than the absolute blood-pressure, and are probably much nearer.

Changes in Blood-Pressure.—The blood-pressure was recorded in seventy-seven experiments on twenty-three men before, during, and two to three minutes after the maximum lift. The pulse rate was recorded before and after the lift. The average of all the measurements was as follows:

	Subject standing.	Subject lying.
Blood-pressure in mm. of mercury before lift	111	110
Blood-pressure in mm. of mercury during lift	180	
Blood-pressure in mm. of mercury two to three minutes after lift	110	110

It appears that the blood-pressure undergoes a sudden and great increase during the lift, and that it falls very rapidly to normal as soon as the muscular effort ceases. This rise in blood-pressure is not accompanied by any great change in the pulse rate. In seventeen examinations on nine individuals during the five seconds of the lift and the fifteen seconds immediately following, seven showed an average increase of five beats per minute, seven showed a decrease of four beats and three continued at the same rate. The pulse rate in these cases returned to normal one minute after the lift.

The rapid return of blood-pressure and pulse rate to normal after the maximum exercise of strength is in marked contrast to the slow return observed after exercises of speed. Hill* gives the pulse rate of an individual sitting quietly as 64, the arterial pressure as 98 mm. Hg; after running rapidly 400 yards, the pulse of this individual rose to 100, and the blood-pressure to 120--130 mm. Hg. Ten minutes later the pulse was still 100 and the blood-pressure 110-115 mm. After a rest of one hour and twenty minutes the pressure had fallen slightly below normal (90-95 mm. Hg); the pulse, however, still continued sixteen beats above normal. The present study shows that in lifting both blood-pressure and pulse rate return to the normal level within three minutes after the lift. This difference between exercises of effort and exercises of speed is of importance. Exercises of maximum strength subject the heart and blood vessels to great and sudden strain, while exercises of speed as a rule encourage functional activity without an immoderate increase in blood-pressure.

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*Hill: Journal of Physiology, 1897–98, xxii, p. xix.

TABLE I.

The blood-pressure in eleven men before, during, and after lifting with maximum strength; the pulse rate[1] before and after the lift. Average of several observations made on each individual.

Name.	Age.	Weight in kilos.	Weight lifted in kilos.	Before lift.		During lift.	2-3 minutes after lift.		No. of beats in distal artery between compression and disappearance of pulse.	Condition of arm.
				Pulse rate.	Blood-pressure, mm. Hg.	Blood-pressure.	Pulse rate.	Blood-pressure.		
Sk.	31	70	216	69	109	210	74	113	1-4	Moderate size, muscular.
Ma.	23	61	118	93	109	165	94	107	1-4	Small, not muscular.
De.	30	60	131	75	93	146	76	95	1	Small, not muscular.
Sa.	31	68	188	67	100	175	67	101	1-2	Large, muscular.
McC.	33	75	170	78	124	178	81	125	1-2	Moderate size, muscular.
Ar.	21	75	178	77	117	207	80	117	1-3	Large, muscular.
St.	41	83	149	78	122	202	77	114	1-3	Large, muscular.
Hi.	25	60	155	84	100	154	80	107	1-2	Small, not muscular.
Be.	26	61	133	77	108	157	78	108	1	Moderate size, muscular.
Me.	27	72	249	76	107	188	78	110	1-4	Large, muscular.
Ja.	26	75	152	73	127	197	74	130	1-2	Moderate size, muscular.

[1] The pulse rate was recorded in the recumbent as well as the standing position. It seemed necessary to give here only the figures for the standing position. The glottis was closed during each lift.

TABLE II.

The blood-pressure in four men before, during, and after lifting with maximum strength; the pulse rate[1] before and after the lift. Every observation made is recorded.

Name.	Age.	Weight in kilos	Weight lifted in kilos.	Before lift.		During lift.	2-3 minutes after lift.		No. of beats in distal artery between compression and disappearance of pulse.	Condition of arm.
				Pulse rate.	Blood-pressure, mm. Hg.	Blood-pressure.	Pulse rate.	Blood-pressure.		
Sk.	31	70	225	64	114	195	75	118	1	Moderate size, muscular.
			220	72	114	206	72	114	3	
			210	72	108	199	72	105	3	
			170	72	104	199	78	118	1	
			223	70	107	199	70	107	1	
			245	66	105	265	78	114	1	
Sa.	31	68	150	62	88	125	54	96	1	Large, muscular.[2]
			190	66	125	221	60	103	1	
			200	72	103	184	72	103	1	
			195	66	97	140	66	96	1	
			220	66	84	184	69	94	1	
			170	72	104	199	78	118	2	

See Notes 1-2 at bottom of table on page 237.

De.	30	60	100	72	92	154	72	92	1	Small, not muscular.
			135	70	88	147	70	98	1	
			60	72	90	140	72	85	1	
			160	84	92	132	90	98	1	
			140	72	97	169	72	92	1	
			155	78	98	132	78	107	1	
Ma.	23	61	60	100	110	125	96	99	1	Small, not muscular.
			90	96	107	136	106	110	1	
			110	93	107	162	96	107	1	
			170	88	114	191	90	114	1	
			160	90	105	213	84	107	3	

[1] The pulse rate was recorded in the recumbent as well as the standing position. It seemed necessary to give here only the figures for the standing position. The glottis was closed during each lift. [2] Subject was tired from cycling.

In Table I, page 235, are shown the blood-pressure in eleven men, before, during, and after the maximum lift, and the pulse rate before and after the lift. In each instance the figures given are the average of several observations made on each individual. In Table II, pages 236, 237, all the observations made on four individuals are recorded, in order that the influence of maximum efforts made at different times by the same individual may be studied. The essential facts brought out by these tables are expressed in the averages already discussed. The pulse rate was recorded

in the recumbent as well as the erect position, but it seems necessary to give only the figures for the latter.

Changes in Intra-pulmonic and Intra-abdominal Pressure.—It is á priori somewhat probable that the sudden great rise of blood-pressure on maximum muscular effort is due in large part to an increase in the intra-pulmonic and intra-abdominal pressure.

To determine this question experiments were made on the rise in blood-pressure produced by expiratory efforts with closed glottis. As a rule there was seen an increase in blood-pressure somewhat greater than that observed during the lift by the same individual (Table III).

TABLE III.

Blood-pressure in millimetres of mercury before and during forced expiratory movements with closed glottis.

Individual.	Before.	During.	Average increase.
Sk.	106	216	120
Sa.	96	201	105
McC.	121	199	77

Evidently there is a marked rise of blood-pressure during forced expiratory movements with closed glottis. The question now arises: What relation does this rise in blood-pressure bear to increased intra-pulmonic and intra-abdominal pressure? The intra-pulmonic pressure was determined approximately by ascertaining how high a column of mercury the subject could support by an expiratory effort continued for five seconds, i. e., the time of an average lift. The following figures, 62, 60, 58, 60, 60, 58, 64, show that the average increase in intra-pulmonic pressure in a typical case was 60.3 mm. Hg.

The intra-abdominal pressure during forced expiration with closed glottis was also studied. An ordinary stomach tube was introduced into the stomach and connected with a mercury manometer level with the stomach. Half a liter of water was placed in the otherwise empty stomach, and the connecting tubes all filled with water containing no air bubbles. The subject then made a vigorous expiratory effort with the glottis closed, and the pressure which could be maintained during the average period of a maxi-

mum lift was recorded. The following observations, 84, 58, 102, 108, 50, 120, on one individual show an average increase in intra-abdominal pressure of 87 mm. Hg.

It has already been mentioned that the average increase in intra-pulmonic pressure during expiratory efforts was 60.3 mm. Hg. The average increase in blood-pressure during expiratory efforts was 77 mm. Hg. (Table III, average of observation on McC.). It seems probable, therefore, that the increase in blood-pressure during lifting with closed glottis is due in large measure to the increase in intra-pulmonic and intra-abdominal pressure. The increase in intra-abdominal pressure in one individual while lifting is given in the following figures, 70, 90, 70, 64, 92, 80; average, 77.6 mm. Hg. This average increase of pressure within the addomen during lifting (77.6 mm. Hg.) should be compared with the average increase in blood-pressure during lifting in the same individual (53.8 mm. Hg, Table I, average of observations on McC.). It will appear that the increase in intra-abdominal pressure during lifting is as great or greater than the increase in blood-pressure.

CONCLUSIONS.

1. A true record of the changes in blood-pressure in consequence of maximum muscular effort is obtained only when the record of blood-pressure is taken during the effort. The blood-pressure falls too rapidly to make later observations trustworthy.

2. The blood-pressure during "exercises of maximum effort" (maximum lift) rises suddenly to a great height. The frequency of the heart beat is very slightly changed. At the conclusion of the maximum effort, which can be maintained but a few seconds, the blood-pressure and the frequency of the heart beat very rapidly return to normal. There is in this respect an important difference between "exercises of effort" and "exercises of speed."

3. Maximum exercises of strength increase the intra-pulmonic and intra-abdominal pressure as much or more than they increase the blood-pressure. It seems probable that the increase in blood-pressure is due largely to this rise of pressure in the abdomen and thorax.*

*I am indebted for much assistance to Drs. W. Muhlberg, N. E. Sanders, and W. Skarstrom; and I am also greatly obliged to the twenty-three men who gave their services as subjects of observation.

BLOOD CORPUSCLE COUNT, HAEMOGLOBIN, AND SPHYGMOGRAPH TRACING AS INFLUENCED BY ATHLETIC AND GYMNASTIC EXERCISE.

BY JAMES A. BABBITT, M. D.,

Haverford College.

In presenting this paper to the members of the Association for the Advancement of Physical Education, a word of introduction and possibly apology is necessary, for though some previous conference in regard to this special line of work had been held with the chairman of the committee, through misunderstanding no notification had been sent until the program was fairly in print.

Consequently much of the work covered in this field, painstaking and deliberate as it must necessarily be, remains in an unfinished state; indeed many of the tests needed to substantiate the statements made here, cannot be completed for six months or a year.

In this as in other fields of investigation, the Scylla and Charybdis of scientific work confronts us—the constant temptation on the one hand to perform such work for its own sake, accumulating a vast array of statistical material of little or no practical value, a fault much resembling that in which the painstaking engineer computes to six decimal places while the error of personal equation may equal five per cent. upon the whole; and, on the other hand, the danger of careless manipulation of delicate apparatus which may entirely vitiate the result.

In view of the incomplete state above mentioned and recognizing the fact that no statistical averages should be accepted save from hundreds or even thousands of uniform tests, the plan of procedure this afternoon will be somewhat as follows:

First—To outline the plan and purpose of the work, state its limitations, briefly describe the apparatus used and method of its employment, and systematize the tests adopted.

Second—To present a few special cases in which blood tests were practically completed and which are at least interesting, and then to discuss the results of pulse-recording in more detail, inasmuch as between 150 and 200 such tracings have been taken.

Third—To draw whatever conclusions we can from these.

The general aim of this work is: First, to secure some valuable scientific data; second, to establish, if possible, some proportionate standard of value for the different forms of exercise now

adopted; third, to obtain actual proof, if possible, of physiological benefit, and fourth, to condemn, where necessary, unfit forms of athletic strain. We hope to submit to the society, as individuals or collectively, at some future date averages where now suggestive cases are presented—I say we, in acknowledgment of the faithful services of two student assistants, Messrs. Dewees and Woodward, who have materially aided the writer.

The limitations to such work seem to reside chiefly in the difficulty in standardizing apparatus, in securing uniform degrees of pressure and tension, resisting variability in temperature, chemical reaction, specific gravity, perception of color, and by no means least in importance in securing perfect cleanliness. Other limitations are shortness of time, paucity of material, uncertainty as to a normal working basis, difficulty in securing special experimental opportunities, and finally the personal equation.

The apparatus used in these tests included the Thoma-Zeiss Corpuscle Counter, the Fleischl Haemometer and the Dudgeon or Marey Sphygmograph. (Exhibition of instruments.)

We have arranged the following group of tests for present work:

1. Tests before and after single period of exercise.
2. Tests before and after season or stated period of exercise.
3. Tests at the close of season's exercise, and again after some lapse of time.
4. Series of tests on anaemic and cardiac cases.
5. Tests for special forms of exercise.
6. Tests on special groups of muscles, for example, snake motion in club swinging, and on method of taking exercise, slow or fast.

Students should be classified as (1) normal; (2) athletic specialists, and (3) anaemic and ill developed.

Coincident with the taking of these tests, there should be made a careful record of the physical history of the subject, his general physiological condition, peculiarities, pulse rate, temperature and, to secure uniformity at later appointment, general surrounding conditions, such as time of day, proximity to meal hour, etc.

So much for the general plan, purpose and method of procedure.

Turning now to the consideration of special cases noted above, we should like for the present to simply report two or three which have come to special notice, probably not typical nor of value save as demonstrating a physiological change which we would like to believe constant under the conditions. Though selected from a large number giving practically negative results, they are at least interesting. We shall consider them simply in relation to the blood corpuscle count.

CASE NO. 1.

Good general athlete specializing in gymnastics.

First test (after long period of physical work and commencing to grow "stale" to copy athletic parlance). Blood corpuscle count, 5,480,000.

Second test (some weeks later). Blood corpuscle count, 5,476,000. (Practically unchanged).

CASE NO. 2.

Leader of general athletic ability, specializing in the running high jump, rope climbing and the 440-yard dash.

First test (before commencing training and after long period of physical idleness). Blood corpuscle count, 4,688,400 per cu. mm.

Second test (after period of training). Blood corpuscle count, 6,768,000. (An exceptionally large gain and probably not constant).

CASE NO. 3.

Good gymnast though not particularly strong, and cardiac condition poor.

First test (on the point of taking systematic exercise for health). Blood corpuscle count, 5,320,000.

Second test (after considerable period of athletic work). Blood corpuscle count, 6,204,000. (As in the previous case exceptional gain.)

CASE NO. 4.

Foot ball player and gymnast, somewhat anæmic.

First test (just closing active athletic work). Blood corpuscle count, 4,700,000.

Second test (after period of rest and dissipation). Blood corpuscle count, 3,636,000.

We have noted in several cases, that a dicrotic pulse is associated with a comparatively low blood count and would invite corroboration from others.

SPECIAL CASES—PULSE TRACINGS.

CASE A—(NERVOUS).

a. Normal and resting, pulse, 54. Tracing irregular, several waves in downward line. *b.* Same after moderate exercise of general character in gymnasium, pulse, 75. Tracing less irregular and normal waves more pronounced. (Chart A.)

CASE B.

a. Normal and resting, pulse, 70. Pulse tracing; average tension, dicrotic notch marked but otherwise normal. *b.* Same after considerable running in gymnasium, pulse, 108. Pulse lower tension and dicrotic notch marked. (Chart B.)

CASE C—(CARDIAC).

a. Normal and resting, pulse, 90. Low tension, markedly dicrotic. *b.* After running, but somewhat quieted, pulse, 150; respiration very rapid. Pulse tracing, low tension and dicrotic wave, in presystolic position. (Chart C.)

CASE D.

a. Normal and resting, pulse, 66. Tracing quite normal and regular. *b.* After running, pulse, 90; but little changed. Case keeps in constantly good condition. (Chart D.)

CASE E.

a. Normal pulse, 62. Pulse irregular and dicrotism marked. *b.* Second test (after short exercise on rings.) Pulse, 86. Tracing much more nearly normal. Dicrotism has nearly disappeared. (Chart E.)

CASE F.

a. Pulse at rest, 73. Low tension, dicrotic and irregular. *b.* After swinging Indian clubs for five minutes, pulse, about 90. Tracing very nearly normal one. (Chart F.)

CASE G—(CARDIAC).

a. Pulse normal, resting rate, 70; marked pre-dicrotic notch. *b.* After running, pulse, 96; tension lowered, dicrotism still marked. *c.* After continued foot ball (Association form), tension low, dicrotism much increased. (Chart G.)

This case had displayed functional cardiac dilatation once or twice within the writer's knowledge.

CASE H—(ANAEMIC).

a. Case weak and ill-developed. Functionally below par. Pulse, normal, 72; irregular, low tension and markedly dicrotic. *b.* Test, after foot ball (Association). Pulse, 95; extremely irregular and dicrotic. First impulse hardly distinguishable in some instances. (Chart H.)

CASE I.

a. Resting, pulse about normal rate, 66, and low tension, dicrotic notch slightly marked, however. *b.* After continued slight exercise, dicrotism disappears and average tension with more nearly normal tracing. Pulse, 84.

Conclusions based upon these and many other tests:

First—That percentage of Haemoglobin and number of red blood corpuscles may markedly increase under well-conditioned exercise, but that this is not universal as many negative results prove.

That exercise continued to exhaustion tends to produce diminished number and proportionate diminution of Haemoglobin.

Second—That the corpuscle count seems to bear some relation to a low grade and a markedly dicrotic pulse.

Third—That long continued exercise such as severe running is productive of a temporary low tension pulse.

Fourth—That moderate gymnastic exercise, such as, for example, Indian Club swinging, tends to remove the over-dicrotic element.

That a pulse tracing is a very deceptive sole guide to vascular condition.

You will readily see that the writer has barely touched the field of study as outlined in his premises, and has entirely omitted much which would be legitimately included in the scope of the work, such as the white blood corpuscle count, the various other methods for determining these statistics, rapidity of the pulse, comparison of radial with the carotid, cardiac and femoral impulse.

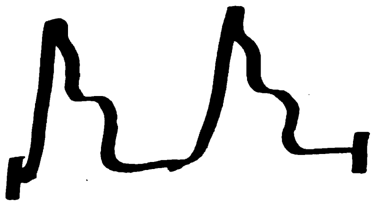
These and many other associated topics must wait for more statistical proof. We only hope we have, perchance, informed some of you as to methods of utilizing this apparatus and possibly influenced some of you to join with us in this investigation.

Dr. Gulick read a paper on the "Psychological Aspects of Muscular Exercise."

Case A.

I

II



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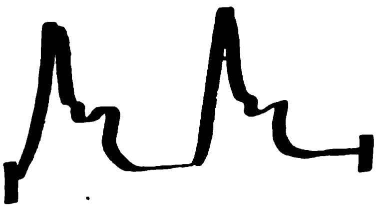

I

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Case C

I

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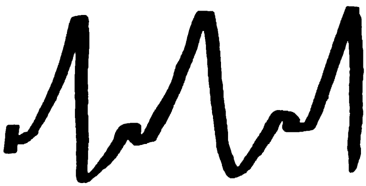

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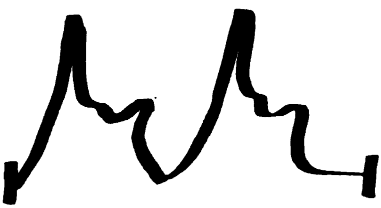

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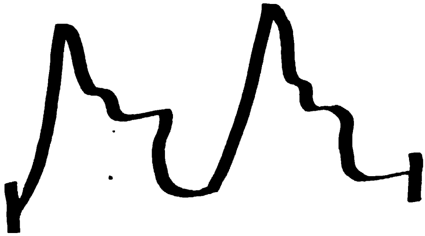
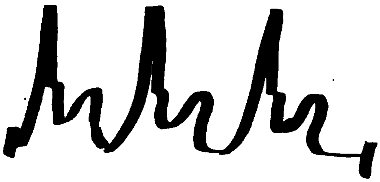
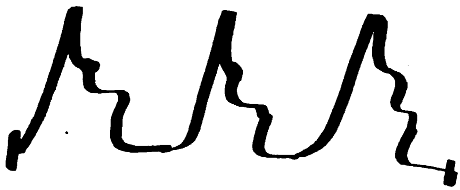


Case E



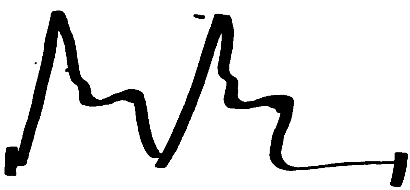
I.

II



Case F.

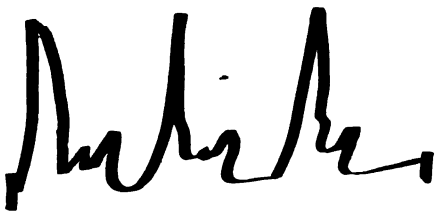
I

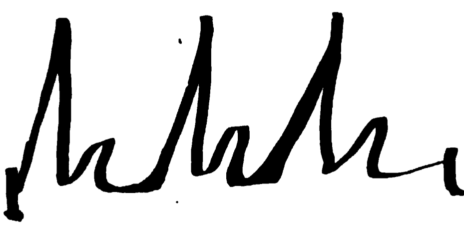


Case G

I

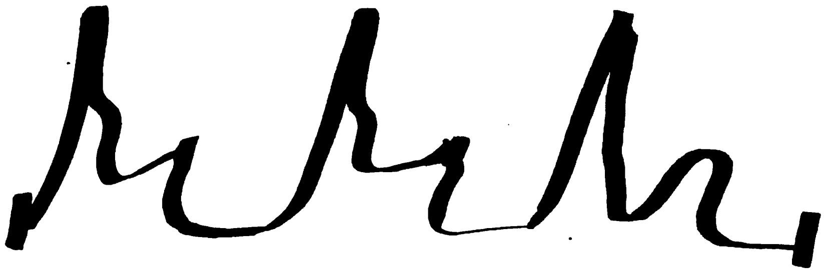
II





III

Case II



I

II

SYNOPSIS OF ADDRESS ON THE FACIAL EXPRESSION OF VIOLENT EFFORT, BREATHLESSNESS AND FATIGUE.*

BY R. TAIT MC KENZIE, M.D.,
McGill University, Montreal, Canada.

The speaker began by describing the conditions under which strain or violent effort is best studied, and by means of different photographs of the same sprinter showed the changes in his expression when at rest and in action.

He then outlined the physiologic process that went on during a short race and in other forms of sudden violent effort. He showed photographs of a face modeled in clay to represent the typical expression of violent effort, and then compared it with illustrations of similar conditions seen in the works of painters and sculptors.

He described the symptoms of breathlessness, showing pictures of men during a race, and an original model of the face showing the typical expression of breathlessness. This was described and compared with the face of Laöcoon and other drawings and statues showing pain, suffocation and approaching death.

The progress of fatigue was then traced from the condition of breathlessness to that of complete exhaustion, and it was shown that there were two distinct stages to be distinguished by their facial expression. This was illustrated by pictures of prominent runners at different stages in long distance races. A picture of an original model was shown to represent the typical face of moderate fatigue aftcr the urgency of breathlessness had worn off. This was compared with the stupid expression of intoxication as pictured by Hogarth and others.

This was followed by the picture of another model showing extreme fatigue or exhaustion, with wrinkled brow, drooping eyelids and gaping mouth. The description of collapse was completed by a picture of three runners showing the different stages of effort and fatigue, both in gait and expression.

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* This paper will be published in full in *Outing* for November, December and January. R. T. M.

THE OUTDOOR GYMNASIUM.

J. H. KELLOGG, M. D.

Man is naturally a tropical animal, and many centuries of exposure to the perverting influence of civilization has not yet so far changed his constitution as to enable him to thrive under the abnormal conditions afforded by the modern air-tight and light-proof houses, and in the stuffy air of the modern counting rooms. The city man is a deteriorated animal, as the result of the increasing aggregation of human beings in the cities.

Most civilized nations are rapidly degenerating toward extinction. J. Ernest Charles recently asserted in a prominent French Journal, Revue Bleue, that at the present rate of degeneration, in 100 years from now, France will be known only as a historical country. Switzerland is moving in the same direction, and New England also. The blight is moving westward. One cannot watch for ten minutes the stream of people scurrying along the crowded thoroughfare in one of our great cities without being profoundly impressed with the blighting influence of a sedentary and indoor life. Pale, sallow faces, sunken, lusterless eyes, narrow chests, stooped figures, lank limbs, and a general weazened appearance speak in pathetic tones of the destructive influence of the artificial life imposed by our modern civilization upon multitudes of human beings, to whom the so-called blessings of civilized society can scarcely be regarded as adequate compensation for the evils and miseries growing out of conventional usages and demands.

Space will not permit a general discussion of the causes of the deterioration of the race, evidence of which one sees on every hand, in every civilized country. More than a quarter of a century of experience with invalids of all classes, and a careful study of habits in relation to health has convinced the writer that indoor life and neglect of exercise are, if not the most important, at least among the most important of the influences which are responsible for the physical decay which finds its expression in the rapid increase of constitutional disorders, visceral degeneration, increase of insanity, idiocy, imbecility, and epilepsy, and the multiplication of crime and criminals. In our anxiety to get as far as possible away from savagery, we have gotten so far away from nature in our habits of life and become so altogether artificial and perverted that a veritable revolution is needed in every civilized community. A Moses is needed who will lead an exodus out of the Egypt of self-indulgence, ignorance of bodily rights and needs, and bond-

age of perverted tastes and artificial practices, back to the simplicity of natural and wholesome human living. A return to nature is the thing needed to correct a great share of the evils in our modern society. This is the central thought in the great movement toward educational reform which has been in progress during the last century, and is equally the dominant idea in rational dress reform, in diet reform, and other efforts having for their objects the correction of erroneous physical habits.

The business man recognizes this principle when, in sheer despair, he tears himself away from the entanglements of financial affairs and exchanges the stifling superheated and poisoned atmosphere of the dark, dingy, prison cell which he calls his office for the light and the freedom and the sweetness and naturalness of the forest secured by an outing expedition to some locality as far away as possible from the sights and sounds and smells of city life. The transformation affected by such a change even within so short a period as six or eight weeks, or possibly less, is often amazing. The sallow color, the depressed expression, the mien and attitude of exhaustion and distress, the leanness and lankness, disappear as if by magic, and the spiritless, tired-out man returns to his work with a new life coursing through his veins, a new energy in his muscles, the nerve-paralyzing toxins cleared out of his brain, and enormously increased ability to grapple with the problems which confront him in his business and social life.

If such a marvelous transformation can be effected in so short a time by naturalness of life, especially by muscular activity out of doors, how much greater and better results might be attained by the habitual and systematic employment of the same measures. The difficulty is to obtain the opportunity. It is to afford the facilities for out of door exercise under conditions favorable for giving the greatest possible good in the shortest space of time that the outdoor gymnasium is advocated. In exercise out of doors the body is brought under the influence of exercise, sunlight and the thermic impressions received from contact with the air.

Exercise, to achieve its greatest benefit, must be combined with light and thermic impressions upon the skin. The greatest benefits of exercise are not the benefits to the muscles, but the improved metabolism, increased blood movement and respiratory activity. The blood is the great, creating, renovating and healing power of the body. In the words of Holy Writ, "The blood is the life." Fresh, oxygenated blood removes waste; awakens the poisoned, anesthetized tissues to renewed activity; supplies material for new construction, improved blood movement, increased functional activity, improved quality of vital work, improved tissues, a higher grade of life. Increased respiratory movement not only introduces an increased quantity of oxygen into the system, but especially

aids in moving the blood through the great viscera, the stomach, the liver, the intestines, the pancreas, the fountain heads of the organic life of the body. With each descent of the diaphragm, the liver and the other abdominal viscera are compressed between it and the resisting abdominal walls. Thus, the venous blood current is pushed onward to the heart; in other words, vigorous respiratory movement is attended by the alternate squeezing of the viscera which empties them of their blood and lymph contents, making way for new material for tissue construction, thus promoting the highest degree of activity of these important centers of vital work.

The important influence of light upon the body has been hitherto little appreciated because little understood. The influence of light in producing pigmentation of the skin in human beings is a matter of common observation. Solar erythema, or so-called sunburn, is always followed by a deepened color of the skin; after this pigmentation has taken place, the surface involved is less subject to sunburn, and may be wholly protected so long as this deepened color is retained. This process in the skin may accordingly be looked upon as a protective action for the purpose of preserving the deeper and more important structures of the body from injury through the noxious influence of the chemical rays. Negroes and other dark-skinned races are not subject to solar erythema, their skins having by long residence in a hot climate, and through the action of heredity, acquired a natural protection against the chemical ray. We are doubtless unaware how much our ordinary life depends upon the action of the thermal and actinic rays of the sun, especially the latter. The fact that an excessive action of the chemical rays gives rise to an acute inflammatory process in the superficial layers of the skin, is sufficient evidence of its powerful influence upon animal life. In conditions of disease persons have been found so sensitive that exposure to even the diffused light of day is sufficient to give rise to a marked erythema of the face.

Finsen has within the last half dozen years undertaken an extensive series of observations for the purpose of studying more accurately the physiological effect of the actinic ray, making numerous experiments upon flies, worms, embryos, and other forms of animal life. These experiments have demonstrated very clearly that the chemical ray is an excitant of the nervous system; and that under ordinary circumstances it may be considered as one of the most important promoters of animal life and energy. The importance of the thermic influences derived from heat rays need not be emphasized, as this has long been well known and appreciated; but the fact that the actinic ray is a direct stimulant of the functions of animal and vegetable life, and thus a means of supporting vital energy in all its forms, is a discovery of the highest

importance, and one which will doubtless prove of great utility in the future. To the chemical rays rather than to the thermic rays must in all probability be attributed the greater part of the wonderful results which have long been recognized as following the proper employment of the sun bath, or so-called insolation.

The influence of sunlight upon the vital processes has been recognized from the most ancient times. The old Greeks and Romans employed the sun bath, or insolation, very frequently in the treatment of chronic maladies of all sorts. The natives of the South Sea Islands and other primitive peoples still utilize this powerful agent in the treatment of the sick. The natives of the terre caliente of Mexico have long practised exposure to the sunlight on the sea-beach, partially covered with sand, as a means of treatment for syphilis, the patients thus treated being made to drink large quantities of infusions of leaves of various sorts while exposed to the sun. The natives of Hayti are said by M. Delow to employ similar practices.

The influence of the solar rays is most active in the summer time because most direct. To receive full benefit from these important physiological agents, the light must be allowed to fall directly upon the skin. This advantage is to some degree obtained in sea bathing, as the bathers often spend fully half the time lying about on the sandy beach, alternately basking in the rays of the sun and dipping beneath the cooling waves. But the bathing dress, scanty as it sometimes is, viewed from the standpoint of conventional modesty, covers so large a portion of the body that there is comparatively little opportunity for the influence of the solar rays. It is important that the whole skin, or as large an area as possible, should be exposed to the action of the sunlight. The outdoor gymnasium affords protection from observation so that the body may be exposed with the scantiest possible amount of protection, permitting the largest amount of surface possible to be exposed, to receive the vitalizing influence of the sunlight, the aim being to tan the whole skin as well as the face, arms and feet.

Another means of physical training of the highest value, which, like the sunlight, has been comparatively little appreciated heretofore, is thermic impressions made upon the skin by contact with cold air or water. Neither water nor air have any specific influence upon the skin, at least by contact, but through the abstraction of heat from the body by contact with the skin or the communication of heat to the body by such contact, most powerful impressions can be made upon every function, tissue and cell in the body through impressions made through the sense organs upon the central nervous system.

An application of cold water in the form of a douche, affusion, rubbing, wet sheet, immersion, or any other measure in which cold

water is brought in contact with the general surface of the body, is always restorative and invigorating in its influence. A man who has been exhausted by laborious effort in a highly heated atmosphere, finds his muscular force wonderfully reinforced by an affusion of cold water, cold immersion, a cold shower bath, and especially by a cold douche.

The application of cold water to the face and head has a wonderfully refreshing effect. The brightened expression, the increased vigor, and the relief which follows a simple bathing of the head, face and neck with cold water when exhausted, are the result of the reflex stimulation of the nerve centers of the brain and spinal cord and the tonic reaction which follows such an application. When the whole surface of the body instead of a small area is acted upon, the effect is proportionately greater.

During the heated term, thousands of lives have been saved in our great cities by the timely opening of free shower baths in crowded tenement house districts, whereby the depressing and exhausting effects of a superheated atmosphere have been successfully antagonized and antidoted by the restorative influence of the cold bath.

The tonic effects of cold water are unquestionably to a large degree due to the influence of cold impressions acting through the nerves of the skin upon the sympathetic nerve centers. The great sympathetic nerve controls the blood vessels, glands, heart, the functions of secretion and excretion, and, in fact, all the vital functions of the body. The awakening of the sympathetic to renewed activity, or a balancing of its action, is what is especially needed by the great majority of chronic invalids, and the average business man is certain to be more or less of an invalid by the time he is forty, if not before. The functions of the brain and spinal cord, and through them all forms of nervous activity, are to a remarkable extent influenced by the sympathetic. The sensation of well-being which accompanies the reaction following a general cold application is largely due to the increased activity of the cerebral circulation, brought about through the stimulation of the sympathetic. By its power to influence the sympathetic, hydrotherapy is capable of controlling, restraining, reorganizing, balancing all the processes of organic life, and through them modifying the functions of animal life to a marvelous degree.

Cold water is a physiological tonic, and has the advantage over medicinal tonics of all sorts in that it awakens nervous activity without the imposition of any extra burden upon any vital organ, and without hampering the activity of any function. The cold bath employed in such a manner as to produce tonic effects accomplishes its results by increasing vital resistance to the causes of pathological processes, by making the wheels of life run more

smoothly, by lifting the whole vital economy to a higher level. The impression made upon that harp of a million strings, the skin, with its vast network of sensory, motor, sympathetic, vasomotor, and thermic nerves, arouses every nerve center, every sympathetic ganglion, every sensory and motor filament in the entire body to heightened life and activity. Every blood vessel throbs and every cell quivers with a new life; the whole body thrills with quickened impulses, the whole being is translated into a new state of existence.

A square plot, one-tenth of a mile in perimeter, is enclosed by a tight board wall ten feet high. A running path six feet in width covered with sand extends around the entire enclosure, next inside the wall. The facilities for exercise comprise swinging rings, horizontal ladders, parallel bars, horizontal bars, a Maypole, a woodpile supplied with axes, saws, sawbucks and logs of different sizes; Indian clubs, dumbbells, quoits, lawn tennis grounds ,and provision for various gymnastic games. In the center of the enclosure is a swimming pool, 35 by 70 feet, 8 feet in depth at one end, 4 feet at the other end. Suitable arrangements are provided for heating the water so that the temperature may be maintained between 65 and 70 degrees. When desired, provision is made for exercise in rowing by means of a boat placed in the pool and moored by an elastic rubber rope. A suitable building near the center of the grounds, on one side, affords shelter from the sun and provides ample dressing rooms, toilet rooms, and facilities for rain or horizontal jet douches. Several fine old apple trees which were found within the enclosure are allowed to remain as a refuge from the direct rays of the sun in the hottest weather.

The outdoor gymnasium is not employed in exactly the same way as the ordinary indoor gymnasium. The exercise is perhaps less vigorous, but is continued for a much longer time. Patrons of the outdoor gymnasium are encouraged to spend as much time as possible within the gymnasium walls, lying in the lap of nature, so to speak, imbibing life and energy and health from the natural environment, catching health from nature, as it were.

Mr. Ingersol committed a great mistake in making what he supposed was a very wise remark. He said he thought if he had been present at the making of the world he would have suggested that health, instead of disease, should be made contagious. Mr. Ingersol was evidently not aware that health is contagious, more contagious than disease. A man has to work hard to get sick. In order to contract a contagious disease he must go where it is or come into physical contact with it in some way. To get a chronic disease he must labor assiduously for many months or even years before all the vital forces are broken down. Consider the amount of hard labor performed by the average dyspeptic before he ac-

quires a really interesting and notable case of indigestion. Health, on the other hand, lies all about us ready to be appropriated if we are only willing to accept of it. We may breathe it in with the fresh pure air if we will. We may absorb it with the sunlight. We may find it in the exhilarating glow of the cold bath followed by muscular activity.

The three great elements of the outdoor gymnasium, exercise, sunlight, cold water, co-operate in the most wonderful way, each to intensify the effect of the other.

Exercise wearies the muscles and fatigues the nerve centers. A short, cold shower bath or a plunge into the swimming pool almost instantly restores the vigor of the muscles and the nerve centers, slows the excited heart and increases both the disposition and the capacity for muscular work. Exposure to the sun soothes the irritated nerves, produces a delightful sense of relaxation, and, either with or without the aid of a small degree of bodily movement, induces vigorous perspiration. The immediate effect is a slight depression of both the cardiac and the nervous activity. Here again the cold bath comes in good play as a regulator and restorer. A short, cold shower bath, a plunge into the cool water of the swimming pool, or a cold horizontal jet to the spine checks excessive perspiration, raises the blood pressure and cardiac tone, and produces a sensation of the most delightful exhilaration and readiness for mental or physical activity of any sort.

Exercise breaks down tissue, removes wastes, while the cold bath promotes the appetite and assimilation. Thus one measure is the complement of the other. Swimming is without question one of the most valuable of all exercises. The position assumed in the water is one of the highest value as a corrective measure, antagonizing the cramped and bent position so naturally assumed in the sitting position. The necessity for holding the head well back restores the curve in the spine, brings the chest well forward in the best possible position for inhalation, while the arm movements executed in propelling the body in the water are the best of all breathing exercises. The bodily effort made creates a thirst for air, while the contact of cold water with the skin stimulates the respiratory centers, rendering easy the fullest chest movements. The movements of swimming are such as to secure full play of all the great muscular groups, and hence symmetrical and equable development. Putting these several elements together, it is apparent that swimming in cold or cool water may be justly placed at the head of all kinds of bodily exercise as a health promoting measure.

The outdoor gymnasium affords the best of all means for general physical development for people in ordinary health. Bicycling, horseback riding, bowling, and such games as lawn tennis and golf, with other moderate out-of-door exercises have a high

value as health promoters, but they lack the added advantages which accrue from the powerful vitalizing influence of the sunshine falling upon a considerable portion of the cutaneous surface and the still more powerful influence of thermic impressions made by the contact of cold water with the skin in the cold douche or the swimming bath.

An outdoor gymnasium ought to be provided in connection with every city school; in large cities numerous gymnasiums of this kind should be established in the hearts of the cities as a means of antagonizing the deteriorating influences of city life. Such a gymnasium might be conducted in connection with city parks. Provision should be made for different social grades or classes, and special pains should be taken to encourage the use of these means of physical renovation by the poorer classes, especially those who are dwellers in tenement houses and in the crowded cottages of narrow, shaded streets.

Hospitals, sanitariums, asylums, children's homes, and prisons should be considered improperly equipped unless furnished with a suitable outdoor gymnasium of sufficient capacity to accommodate every inmate. Ordinary out of door exercise is beneficial, but exercise under the conditions provided by the outdoor gymnasium, as I have attempted to show in the preceding paragraphs, is more than doubly effective as a means of health-promotion.

This article very inadequately represents the general plan of the outdoor gymnasium constructed under the direction of the writer, and the plan outlined certainly offers many points for improving modifications. But the writer feels confident that the special advantages pointed out are based upon sound physiological principles, and that the outdoor gymnasium is bound to become an important factor in the promotion of the public health, while also serving as an important therapeutic measure in connection with hospitals, sanitariums, and other medical institutions in which chronic invalids are received for care and treatment.

The purpose of this paper has been rather to introduce the subject than to treat it exhaustively, and it is the hope of the writer to be able to present, in a later paper, a considerable amount of scientific data which has been and is being collected, which will set forth in a more definite and exact way the special advantages of physical exercise when systematically combined with the application of the sun's rays to a large portion of the cutaneous surface, and of the cold bath administered with scientific direction and precision.

Evening Session, 8 p. m.

EXHIBITION OF EDUCATIONAL GYMNASTICS.

Adults.—Columbia University Gymnasium, 119th Street, between Amsterdam Avenue and Broadway.

Mass drill, heavy gymnastics and fencing—Men's classes, New York Turn Verein and Newark Turn Verein.

Dumb-bells, bar-bells and bounding balls—Business Women's Class, Dr. Savage Physical Development Institute.

Indian clubs and fencing—New York Normal School of Physical Education.

Class wrestling and pyramids—Students from Columbia University.

Dancing calisthenics—Women's Class, St. Bartholomew's Girl's Club.

Mass work and games—Young Men's Christian Association.

PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF PHYSICAL EDUCATION.

Held at Assembly Hall, Department of Education, New York City, April 18-20.

FINAL BUSINESS MEETING.

Meeting was called to order by the Convention Chairman, Dr. Gulick, who questioned the body as to business to come before the meeting.

Mr. Hillyer asked if new business was in order, and stated that he wished to present two resolutions in writing for the consideration of the meeting.

The Chair asked that these be deferred until later.

Dr. Savage stated that he would like to present request for appointment of committee. Likewise deferred.

Dr. Fitz said that the question of increase of dues must come up if the proposed New Constitution were not adopted.

Dr. Eberhard stated that he wished to make motion before adjournment tendering the thanks of the Association to the Local Committee for the arrangements of this meeting.

After these suggestions the Chair made announcements for the dinner that evening, and then called upon the Chairman of Constitution Committee appointed to consider the advisability of adopting the proposed new constitution and report to the convention. This committee, as appointed by the Chair the previous day, consisted of Dr. J. W. Seaver, Chairman; Dr. D. A. Sargent, Dr. J. H. McCurdy, Dr. J. A. Babbitt, Dr. W. L. Savage.

This committee had been instructed to consider also the report of "the Committee of Nine" on normal schools.

Dr. Seaver called upon the committee's secretary, Dr. Babbitt, to read the report of the committee, which was a majority report. This was to the effect that it would be wise to table the proposed new constitution until the next convention, in view of the short notice and change in headquarters of the Association.

This committee further reported in regard to the report of the Committee of Nine on normal schools, that they concurred with the result of the section meeting on normal schools, held the day before, which carried Dr. McCurdy's motion, "that we decide that it would be unwise at this time to do anything with the report"; furthermore, this section voted to recommend to the Association

that it endorse the rules for basket ball for women as arranged by the committee appointed at the Springfield conference of which Dr. Foster was chairman.

A motion was made and carried that the report of the Convention Committee be received.

The Chair called upon Dr. Sargent as representing the minority for its report which was given as a general defense of the new constitution. Dr. Sargent, in minority report, discussed history and origin of the proposed new constitution, explained its provisions and stated reasons for its inception. Advised that wrangling work be thus relegated to sections and committees. Stated that it was a representative constitution in which disaffected members could have voice. He outlined the position and function of various proposed officers by comparison with those in charge of present meeting. He stated that if program had been left in hands of the general council, time schedule, etc., could have been arranged in such a way that all desirable papers could have been heard. He criticised the action of Committee of the Convention and forecast a doubtful future in living under a confused combination of new and old constitution. He claimed absolute unselfishness in the preparation of the constitution and expressed gratification for this, perhaps the best meeting ever held, and practically held under the new constitution. He then suggested that we get into a committee of the whole and provide something for the conduct of the society.

Chair objected to such method of procedure and further announced that he should enforce Tuesday's decision in regard to allowing speakers to occupy the floor twice.

It was moved by Mr. Leyerzapf and seconded by Mr. Hillyer that the majority report of the committee be accepted as a ruling of the Society.

On motion of Dr. Halstead the minority report presented by Dr. Sargent was received.

General discussion on Mr. Leyerzapf's motion.

Dr. Arnold—We are adopting a constitution into which we have yet to grow and there is danger in such a course. We are not yet in status of ordinary societies of scientific investigation and not ready for all this sectional division. The new constitution is clumsy. The old constitution has proved elastic enough to give us a good meeting. The old constitution has centralized our work and there are features of the new constitution which render it unacceptable at present.

Chair raised the point as to whether it was possible to adopt the new constitution at that time according to the rules.

Dr. Fitz referred to points covered in the old constitution as to this and stated that the publication in the Review was con-

sidered by the Boston Council to fulfill necessary conditions as to notice.

Mr. Day—I would regret the adoption of the new constitution. We have grown, but the Y. M. C. A. and Turners are not sufficiently interested as yet. We have been making progress under the old system. (He compared the section work in the Y. M. C. A. conferences.)

Mr. Bolin—I wish to underscore the remarks of Dr. Arnold. Members at large should have more vote. Note the work of the Boston Council and sections. We have been growing under the old constitution. A drop in interest would result from the change.

The Chair here requested the vice chairman, Mr. Hillyer, to take the Chair, thus allowing him the privilege of the floor.

Dr. Halstead rose to point of order as to whether discussion was not anticipatory. Not sustained.

Dr. Gulick—This matter can be discussed at length uselessly; every constitution and by-laws are not as appearing on paper, but as carried out. The council may be in New York next year. New York City is opposed to changing the constitution suddenly and it would put New York City in a bad place to work if a change were made. The Society grows not by changing plans and constitution, but by work in the intervals.

Mr. Nillson—I want to see the council changed and new work result.

Vice Chair Hillyer brought up a point as to his having asked to have the report published in the Physical Education Review.

Dr. Fitz—There are ins and outs to the constitution—more outs than ins. We have grown up to this new constitution gradually. The Boston Society has accomplished most of the work in this and represents the Society in its group work. Now, are the members of this association ready to decide this question wisely? (Speaking time extended by vote). Growth has been attributed to the work of local societies, but much of the growth of local societies has been detrimental to the society at large, from momentary enthusiasm. Many of these societies were developed with a hurrah. Genuine increase in membership has come in more from members at large. I (Dr. Fitz) shall probably have to drop my position with the society, hence liberty in speech. I came to the association meeting prepared to decline the position of permanent secretary. There is value of permanence in this position from the sending and receiving of mail.

Mr. Coop—I want the new constitution to run the convention with an old one between times.

Dr. Hughes—(Brief remarks not understood by the secretary).

Mr. Channing—From a disinterested view the work on the constitution has been good—as good as we could possibly have.

Miss Weber discussed the question as to extra payment for the Review.

Dr. Sargent—I rise in answer to points raised in discussion. Council wants to be in New York next year. We are through in Boston and simply want to help with our experience. We desire to get in affiliated organizations. All should have representation and the new constitution provides this. The request for a new constitution came from the New York Society. I can find more fault with it than any member present from having fought the matter over. Responsibility in this new plan is thrown directly on the heads of departments represented.

Dr. Fitz moved as an amendment to the previous motion, that the minority report be accepted. This seconded.

Mr. McDermott—I have not heard why they do not want the new constitution adopted. I do not see any snakes or deals in it. Tell us what objection there is to the new constitution.

Dr. Arnold—I think it unwise to move. I should like all motions downed and then the matter brought directly before the body.

Dr. Groszmann—I oppose the manner in which the new constitution is brought in. I would like time for proper discussion.

Dr. Brown—I would like to put myself on record as not opposing the manner or method, but opposed directly to the new constitution.

(Ruling of the Chair that the adoption of the minority report would be accepting the new constitution).

Dr. Fitz withdrew his amendment and then the original motion was lost.

Mr. McDermott moved that the convention proceed to the consideration of the proposed new constitution.

Motion made and carried.

Motion made by Mr. Eberhard and accepted that necessary business of the convention be first attended to. Carried.

The following resolution presented by Mr. Hillyer was adopted:

"Resolved, That the sincere thanks of the American Association for the Advancement of Physical Education are due and are hereby extended to the following associations, societies, etc., for their able and efficient assistance in the execution of the program of the convention. The Board of Education; School Boards of Manhattan, Brooklyn, The Bronx and Queens; the President and Trustees of Columbia University; the North American Gymnastic Union, the Y. M. C. A. branches of New York and vicinity; each and every speaker at the convention who is not a member of the A. A. A. P. E; the Ninth Regiment, N. G. S. N. Y., and its Colonel, W. F. Morris, and all participants in the various exhibitions not otherwise individually or collectively named in this resolution; and furthermore to Miss Emily Ogden Butler.

"Resolved further, That the secretary of this convention shall see that the substance of the resolution be transmitted to each organization or individual named above."

(A form for transmission was appended.)

On motion of Mr. Eberhard the thanks of the convention were extended to the local society.

Dr. Savage brought up the question as to the outcome of the meeting on anthropometry. He moved that the report of the Committee of Five for the revision of anthropometric apparatus and measurements, appointed by the National Council, be adopted. This seconded.

Discussion.

Dr. Sargent—We ought to await the report of the larger Committee of Nineteen.

Dr. Savage—We are willing to accomplish the best results. The Committee of Nineteen is delaying, hence we should not wait. The work of the Committee of Five will not interfere.

Motion carried.

Dr. Fitz—(Speaking from the Committee of Nine on normal schools)—The Association should put itself on record as demanding certain qualifications. I make a motion that the first thirteen articles of the report be adopted as demanding certain minimum requirements.

Chair objected in view of the convention committee's report and asked the convention to sustain him.

Dr. Arnold sustained Dr. Fitz's motion as being in order.

Chair declined to continue.

Dr. Arnold moved that we reject the second part of the convention committee report. This carried. Third part of convention committee report then also rejected.

Dr. Fitz repeated his former motion that the first part of the report of the Committee of Nine, up to and including the thirteenth article be adopted and recommended by the Association to the normal schools.

Discussion.

Dr. McCurdy—It seems unwise for the convention to simply recommend the minimum limit for required study.

Mr. Bolin—I move, as an amendment, that in article thirteen the word suggested be substituted for adopted. (Upon request withdrew this amendment.)

Dr. Savage moved as an amendment, that the matter be taken up, article by article. Motion lost.

Vote on Dr. Fitz's motion above. First count—Yes, 109; no, 122. Vote questioned and recast. Second count—Yes, 143; no, 133. Motion to again reconsider was lost.

Motion made to proceed to the consideration of the place for next meeting.

Dr. Fitz moved to amend this by referring to the next council. Neither acted upon.

Dr. Fitz moved to proceed to the consideration of the new constitution, and moved that the first part up to the location of meeting be adopted.

An intercepting motion to adjourn was lost.

Dr. Sargent asked here what New York wanted, anyway.

Mr. Hillyer referred to the ruling of a previous convention that the present convention committee should act as the new council.

Dr. Seaver referred (for information) to the old constitution.

Dr. Fitz rose to a point of information as to the ability of the convention to act freely in this matter.

Dr. Hillyer answered this in defense of his statement.

Dr. Fitz rose to a point of order—discuss motion before the house.

Mr. McDermott questioned as to the right of way for his original motion, but was not sustained by the Chair.

On motion of Dr. Arnold, Article I, and similar motion by Dr. Fitz, Article II, was adopted by the convention. (This after discussion by Dr. Savage.)

Motion was then made and carried that Article III be adopted, after amendment made by Dr. Arnold and accepted, that it should be altered to read "Members and honorary members."

Article IV was adopted, omitting the words, "or fellows."

Discussion on Article V by Dr. Collin, Dr. Fitz, Dr. Seaver and Dr. Hughes.

Article VI stricken from the list and Article VII adopted.

Article VIII stricken out.

Article IX adopted with words "or fellow" omitted.

Article X adopted.

In regard to Article XI, a motion was made that the New York Society be empowered to elect these officers.

An intercepting motion to adjourn was lost.

Motion as to Article XI was lost.

Another motion was made that Article XI be adopted provisionally with liberty to the new council in interpretation and action. Motion carried.

Motion to adopt Article XII was carried.

Article XIII was accepted provisionally as Article XI. Question was raised from the floor as to the ruling on Article XI. Chair ruled that Article XI should remain as above decided.

Dr. Seaver moved that we delegate to the New York Society the authority to select the place and date of the next convention.

Dr. Sargent moved that the council be appointed here in New York and that they have the management of the meeting. Motion not carried.

Motion to adjourn was again made and now carried.

Signed. JAMES A. BABBITT,
Secretary of the Convention.

The constitution under which the association is now acting reads as follows:

NAME.

Article 1. This body shall be called the American Association for the Advancement of Physical Education.

OBJECTS.

Art. 2. The objects of this Association shall be to awaken a wider and more intelligent interest in physical education; to acquire and disseminate knowledge concerning it; and to labor for the improvement and extenion of gymnastics, games and athletic pastimes in the education of children and youth.

MEMBERSHIP.

Art. 3. The membership of the societies belonging to this association shall consist of members and honorary members.

Art. 4. Any person may become a member of the association upon recommendation by two members and election by the council.

Art. 5. Honorary members shall not exceed the proportion of one to twenty-five members, and shall consist of persons well known as advocates and supporters of physical education. They shall be nominated by the council and require a two-thirds vote of the members present to elect.

Art. 6. The name of any member two years in arrears for annual dues shall be erased from the list of the association, provided that two notices of indebtedness, at an interval of at least three months, shall have been given; and no such person shall be restored until he has paid his arrearages or has been re-elected.

Art. 7. No member shall hold office in more than one section at any one meeting.

OFFICERS.

Art. 8. The officers of the association shall consist of a President, a Vice President from each Section, a permanent Secretary, a general Secretary, a Secretary of the Council, a Treasurer, and a Secretary of each Section. These officers, with the exception of the permanent Secretary and the Treasurer, shall be elected at each meeting for the following one and, with the exception of the

Treasurer and the permanent Secretary, shall not be re-eligible for the next two meetings. The term of office of the permanent Secretary and the Treasurer shall be five years.

Art. 9. The President, or, in his absence, the senior Vice President present, shall preside at all general sessions of the association and at all meetings of the council. It shall also be the duty of the President to give an address at a general session of the association at the meeting following that over which he presided.

Art. 10. The Vice Presidents shall be chairmen of their respective sections, and of their sectional committees, and it shall be part of their duty to give an address, each before his own section, at such time as the council shall determine at the meeting subsequent to that at which he presides. The Vice Presidents may appoint temporary chairmen to preside over the sessions of their sections, but shall not delegate their other duties. The Vice Presidents shall have seniority in the order of their continuous membership in the association.

(Articles 8 and 10 were adopted provisionally with liberty to the new council in interpretation and action.)

AFTERNOON SESSION, 2 P. M. (Admission Tickets required.)

Ninth Regiment Armory, 125 West 14th Street

EXHIBITION OF EDUCATIONAL GYMNASTICS—CHILDREN.

A. PUBLIC SCHOOLS

Primary Classes.

A gymnastic story—Boroughs of Manhattan and The Bronx.

A day's order, third year pupils, illustrated by bean bag exercises—Borough of Queens.

Grammar Classes.

Freehand exercises for the Gymnasium—Boroughs of Manhattan and The Bronx.

Class room gymnastics, boys, fifth school year—Borough of Brooklyn.

School gymnastics with iron grace hoops, girls, sixth school year—Borough of Brooklyn.

High School Class

Extension exercises, balancing movements, club swinging, jumping—Girls' Class, Wadleigh High School, Borough of Manhattan.

B. PRIVATE SCHOOLS AND OTHER GYMNASIUMS.

Flag Drill, Junior Class—Young Men's Christian Association, Newark, N. J.

Tambourine Drill, Girls' Class—South Brooklyn Turn Verein.

Calisthenics and Wand Drill, Boys' Class—Bloomingdale Turn Verein.

Military Gymnastics—Cadet Corps, St. Francis Xavier College.

CLOSING SESSION.

Saturday, April 20th 7 P. M., Hotel Manhattan, Madison Avenue and 42d Street.

The closing session of the convention consisted of a reception and dinner to Dr. Edward Hitchcock of Amherst, at the Hotel Manhattan. The reception was from seven to eight and the dinner from eight till eleven.

The guests of the Association on this occasion were as follows:

Dr. Edward Hitchcock,	Mr. Charles M. Pratt,
Dr. John M. Tyler,	Mr. A. T. Schauffler,
Dr. Franz Boaz,	Dr. Charles H. Judd,
Mrs. Franz Boaz,	Dr. J. M. Rice,
Dr. Lucien C. Warner,	Mr. Richard C. Morse,
Mr. George D. Pratt,	Mr. Edward H. Fallows,
Mr. Frederic B. Pratt,	Mr. William Blaikie,
Dr. Edward R .Shaw,	Dr. Matilda K. Wallin.

Dr. R. Tait McKenzie offered the following motion, which was seconded by Dr. E. H. Arnold:

Moved, that we extend to our friend and co-worker, Dr. Edward Hitchcock, our most hearty congratulations and good wishes upon his completion of forty years of continuous service in the cause of physical training at Amherst College, and that we express our judgment that the long continued and high place that has been given to physical training at Amherst has been one of the strong factors in securing for physical training its present status in educational circles.

The motion was carried unanimously.

The President of the Convention, Dr. Gulick, said before introducing the speakers that the occasion marked first, the personal love and friendship for the men who had stood during all these years for strong, personal helpfulness in the field of physical training, that the contribution of Dr. Hitchcock to this cause lay primarily in his personal strong relations to the multitudes of Amherst students who had been related to him and to whom he had given his life; and, second, that this occasion was made also to suitably recognize the strong influence of the Amherst College physical department during these years in the cause of physical training; and third, it was a time for reminiscence, a time in which tc think of and to study the great advances that have been made in the cause of physical training during the last forty years.

The speakers of the evening were at liberty to take any phase of any of these topics. The following persons spoke:

William Blaikie.

Superintendent E. P. Seaver, of the Boston Public Schools.

Dr. D. A. Sargent, of Harvard.

Professor J. M. Tyler, of Amherst.
Mr. A. T. Schauffler.
Dr. W. L. Savage, of Columbia.
Mr. Edward H. Fallows.
Mr. R. C. Morse.

One of the pleasant parts of the evening was the presentati to Dr. Hitchcock of a large number of congratulatory letters fr... members of the Association and from a few others prominently identified with education in general.

The address of Professor Tyler of Amherst, is published in full, as it seems to express the general sentiment of the evening better than any other one.

ADDRESS BY JOHN M. TYLER.

It frequently happens that the credit given to a reformer is inversely proportional to the need and wisdom of the reform. As we look back upon the beginnings of physical training in our colleges, we naturally think that the movement must have received universal approval and welcome. No one could fail to see that it was an essential part of every wise system of education. Its introduction must have been as easy as its later growth and spread was rapid.

Fortunately some of us can remember the ridicule and opposition against which the movement had to force its way. Some urged that the body was not worth developing and training; others that it did not need it, but could care for itself. Still others felt that time could be spent far more profitably on Latin or mathematics than in swinging a pair of wooden dumb-bells. To dignify such work or play by requiring it of seniors in a college was far beyond its deserts. The arguments were the same which are now reiterated against the introduction of physical training in the public schools of our smaller cities and towns; but the opposition was stronger and more bitter.

Under such conditions, but with the strong and cordial support of President Stearns, Dr. Hitchcock entered upon his duties at Amherst College. You know his work and success during the forty years. I am here to speak of the man, not his work.

To see the need and possibilities of the work required the prophetic vision of a seer and enthusiast; to discover the proper system and methods of physical training for college students demanded the shrewd common sense and ingenuity of the most practical man. All these qualities were united in Dr. Hitchcock; otherwise only failure could have awaited him.

Forty years ago no one could have had more than a dim vision of the grand future which lay before the department. The best that any one could have dared to hope was that it would promote

the health and physical vigor of the student. This was surely enough to justify the undertaking.

Now competent physiologists tell us that the nerve centers which control our heavy muscles of trunk, shoulder and thigh, form the foundation, so to speak, on which the other, younger centers of the brain can rest secure; and that a good development of these fundamental centers enables a man or woman to bear the stress and strain of modern life without falling a victim to hysteria or nervous prostration. The teacher who can promote a vigorous development of these muscles in the young child is insuring calmness, steadiness of nerve, moral endurance in the adult.

If the development of our ruder, heavier muscles can produce so great results, what will be the result of training the finer fore-arm and finger muscles of the child? May not a correct system of such training most effectually promote intellectual development? In our arborial ancestors hand and intellect seem to have developed simultaneously. May not the bond between the two be closer than we have dared think?

We are beginning to re-arrange the educational values of children's plays. Dr. Gulick has shown us that the athletic sports of the youth of the most highly developed races not merely bear witness to, but in a large degree promote and determine their higher civilization. That "Waterloo was won at Rugby" may be true in a far deeper and broader sense than even we have suspected. But this moral and intellectual value of physical training could be but dimly perceived and by very few when Dr. Hitchcock began his grand work.

I am here especially to tell what we Amherst Alumni and students think of Dr. Hitchcock as a man. It is no easy matter to vivisect one's best friends for the benefit of a large audience. The life is very likely to escape in the operation. Fortunately you all know and appreciate our doctor so well that, if any picture lacks life, warmth and color, you can make good the defect from your own knowledge.

Dr. Hitchcock's most marked trait is his abounding vitality. The life of some men is like a little pond in the woods, with neither inlet nor outflow. Such men exist. The life of others is like the torrent of water which gushes from a machine pump in one of your shop windows. The water makes a prodigious show; but it all comes from and goes back to a small tank in the cellar.

A life like that of our friend can be compared only to an unfailing spring, which pours from the granite ledges of some New England mountain. You can trace its course far down into the valley by the verdure and flowers along its banks. The activity of such a man is tireless. His feet are swift and his arm strong to hold a friend or to overtake an evil-doer. His brain is equally

active, and his broad experience has made him shrewd and wise. Every one leans on him, and he bears the burdens of a whole community.

An abounding vitality of this kind, the only "real article," springs always from a great heart. "Out of the heart are the issues of life," says the Good Book. In Bunyan's "Pilgrim's Progress" it is Great-heart, not Swelled-head, who conquers giant Despair. Many a weary pilgrim has our great doctor rescued from the clutches of that giant. Here again he has proved himself a pioneer in education. President Hall tells us that one important characteristic of the education of the twentieth century will be its developments of the heart as well as of the intellect.

Such a man must be original and unique. He refuses to be fettered by conventionalities of thought, word, or deed. The terse, vivid, Anglo-Saxon expressions, the shrewd turns of thought, the odd illustrations, the patriarchal discipline of Dr. Hitchcock will never be forgotten by his pupils.

However deeply such a man may study and think along the lines of his own department, he will never fossilize as a narrow specialist. He will always be, as Emerson says, "Man thinking," not "a men thinker, or, still worse, the parrot of other men's thinking." His human sympathies are too strong, his interests too broad, to allow such degeneration. A real danger of our present educational experiments is that our chairs of teaching will be occupied by weazened and vastly learned bits of humanity. This is educational dry-rot. I am not decrying learning. I plead for a virile manhood of abounding vitality.

Such a man can never grow old. Physicians have said, "A man is as old as his arteries," rather, he is as young as his heart. He attracts men to himself, infects them with his own courage, hopefulness, good cheer, enthusiasm, and lifts them to a higher plane of life. This is essentially the highest education.

Finally a man like Dr. Hitchcock cannot but attach to himself a host of friends. Wherever I meet an Amherst Alumnus his first question is almost always, "How is the Doctor?" The time will yet come when he who can make himself a host of friends will be accounted more successful than he who has accumulated vast wealth or even learning.

Since Dr. Hitchcock has done so much for us, and been so much to us, we own him. We have willingly loaned him to you for one evening, but he belongs to us. To us he is "The Doctor," nothing more nor less. We have had many good doctors at Amherst, doctors of medicine, of laws, of divinity. There never has been but one "the" doctor. In all probability there never will be another. So we Amherst men toast in Oriental language the man who with strong hand rules us through our hearts. Oh, Doctor, live forever!

EDITORIAL NOTE AND COMMENT.

As the previous Secretary of our association, Dr. George W. Fitz, has with such force and cogency urged on the occasions of the last two National conventions, the financial basis of our society is not only precarious, but the income does not permit the publication of matter to the extent that is desirable. It is true that the present degree of efficiency cannot be maintained without some increase in the revenues of the society. Furthermore, a careful study of the membership of our societies, made by Miss Bancroft, indicates a state of affairs that demands remedy. Miss Bancroft's figures are as follows:

MEMBERSHIP BY STATES, DECEMBER, 1901.

Massachusetts	258	West Virginia	3
New York	174	Georgia	3
Pennsylvania	70	Kentucky	2
Connecticut	50	Tennessee	2
Ohio	43	South Carolina	2
Michigan	32	Minnesota	2
Illinois	32	Kansas	2
New Jersey	16	Washington	2
Wisconsin	14	Oregon	2
Rhode Island	13	California	2
Maryland	12	Utah	1
District of Columbia	10	Arkansas	1
Maine	8	Louisiana	1
Nebraska	8	Canada	8
Colorado	7	England	8
Iowa	6	Scotland	1
Indiana	5	France	1
Virginia	5	Hawaii	1
Missouri	5		
Texas	4	Total	819
New Hampshire	3		

ANALYSIS OF CARD CATALOGUE, DECEMBER, 1901.

	Membership in Local Societies.	Not Affiliated with Local Societies.	Total Membership.
New England Section—			
Boston	117		
New Haven	39		
Total	156	170	326
New York Section—			
New York	112		
Syracuse	11		
Total	123	49	172
Middle Atlantic Section—			
Philadelphia	28		
Western Pennsylvania. No report of number		86	114
Lake Section—			
Southern Michigan	21	43	64
Ohio Section—			
Cleveland—inactive			
Cincinnati—inactive			
Ohio P. E. Soc.—inactive		56	56
Northwestern Section		21	21
Mississippi Valley Section		12	12
Southern Section		18	18
Western Section		7	7
Foreign		29	29
Total	328	491	819

The report of societies shows a most unhealthy state of affairs —even worse than the catalogue indicates, in that, while there are nominally twenty-three organizations, only six responded to the Secretary's letter. Of this number three reported as discouraged; one, dead; and one as having no meeting this fall. It is known, however, that there are at least three other organizations in a live and fairly prosperous state of existence.

The second table shows the distribution of members affiliated; that is, connected with the local as well as with the national society. The astonishing fact develops that less than half of the members support the local societies. In New England, for example, where the association has centered for four years past and

where the local organizations are convenient, a little less than half the members are unaffiliated, or 161 out of 326. Again, in New York, 40 out of 172 are not affiliated; in Philadelphia, 86 out of 114; in the lake section, 35 out of 64; in Ohio, 40 out of 56; and so on. Naturally, we ask what is the cause of this state of affairs, and the general answer would seem to be that there are no societies near many of the members to which they can attach themselves, or, if there are such, the members are not aware of them or the societies are inactive, both of which facts may be true although not necssarily so nor even rightly so. This answer, however, does not apply in the case of New England, New York, Philadelphia and Chicago, which comprise at least three-fourths of the members almost one-half of whom are not affiliated.

The answer which we would suggest is that the very organ which has been so valuable to us all and so ably edited from the start, the Review, having as its main object the building up and the holding together of the society, has actually benefited the individual to the detriment of the organization by giving at cut rates the best of the material read before the societies. For example, if one becomes a member of the local society, works for its interests, gives time to attend its meetings, serves on committees, etc., he pays dues of $2. But if he joins the national body, he saves both his time and $1, may read the Review at his leisure, and reap all the other benefits of membership in the national society.

The council have considered the matter fully at different meetings, and have the following plan to offer for discussion by the members of the society:

1. That the subscription price of the Review be made two dollars ($2.00) per annum.
2. That membership in the American Association for the Advancement of Physical Education, including the Review, be made two dollars ($2.00) per annum.
3. That all dues be sent by members directly to the Secretary of the National Association.
4. That the National Association remit, through its Secretary, to the local societies which are affiliated with the National Association and which are active, one dollar ($1.00) for each member who has so paid. An active society shall be considered one which has held at least four public meetings during the preceding year and sent reports of same to the National Council.
5. That local societies shall arrange their own dues with members who are not also members of the national organization. Members who pay dues only in the local society shall not receive the Review.

6. That the dues of members of the National Association who are not also members of local societies shall be retained in full by the National Association.
7. This to take effect January 1, 1903.

It is believed that these proposals will, if carried out, result in a material increase in the financial support of the National Association; in an increase of members and in the activity of local societies; and in a closer affiliation of local societies with the national body.

It is requested that the members of the society will think over these resolutions freely and report their conclusions to the Secretary of the National Association, Miss Bancroft.

WATSON L. SAVAGE,
President.

Individuals having incomplete files of A. A. A. P. E. conventions preceding Physical Education Review will confer a favor on those desiring to complete such reports by either giving them to the Secretary of the Society or notifying her at what price the different numbers will be sold.

On the evening preceding the convention an exceedingly pleasant reception was given by Miss Butler at her home to the delegates of the convention. The reception was largely attended and helped materially to establish and re-awaken that personal acquaintance and feeling of good-fellowship which characterized the convention.

THE Ball plays a prominent part in the majority of our American games. This has stimulated manufacturers in efforts to surpass each other in grade and finish in order to satisfy the intelligent and critical players.

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EDITORIAL STAFF:
LUTHER GULICK, M.D., EDITOR.

ASSOCIATE EDITORS:

THOMAS H. BALLIET, PH.D.
FRANZ BOAS, PH.D.
MAXIMILIAN P. E. GROSZMANN, PH.D.
THEODORE HOUGH, M.D.
FRED EUGENE LEONARD, M.D.
R. TAIT MCKENZIE, M.D.
HENRY LING TAYLOR, M.D.
MATILDA K. WALLIN, M.D.

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AMERICAN
PHYSICAL EDUCATION REVIEW.

Vol. VI. DECEMBER, 1901. No. 4

THE PROPAGANDA OF PHYSICAL EDUCATION THROUGHOUT A STATE.*

WM. W. HASTINGS, PH.D.,
University of Nebraska.

"Every state ought to be thoroughly organized for the promotion of an adequate interest in the physique of its student population, from the kindergarten to the university. Physical facts need restatement in a terse, concrete form to teachers and pupils. There is sufficient general realization of the value of exercise for the promotion of health, but there is no definite practical and prevailing system of bringing about permanent reform.

"The masses of the people do not understand the meaning of weakness, atrophy, and low vitality. They are just as sympathetic with physical education reform as they know how to be. They understand that physical evils exist and that in the abstract there is some remedy for them, but it rarely occurs to them that the state ought to apply the remedy. These people can be aroused to a live interest only by the presentation of concrete facts from their own immediate surroundings. Given this vital interest, and the whole matter of physical education solves itself. The need of gymnasia, physical instructors, time for exercise, character of exercise, etc., will be met. Nothing excites interest like local facts.

"The best thing to arouse an interest throughout a state is to give physical examinations to the children of the state. The result of this investigation will be an interest created in students, parents, teachers and school boards.

"Children learn that they have a body to be developed, become

* Address prepared for the Physical Education Congress of the Paris Exposition, June, 1900, by Wm. W. Hastings, national delegate of the A. A. A. P. E. and general delegate from the U. S.

intelligently interested in care of health. Parents are reminded that the strength of their children is their immediate and most vital obligation.

"Teachers understand that their pupils are not alike in physical capacity, that some must be pushed in their studies and some retarded, or rather their interest diverted into physical development for their own ultimate good. They learn that to prod the child out of one grade into another is not the supreme end of good service; that certain children who appear dull and lifeless at times are so from pathological reasons rather than psychological; that such children are not stubborn but physically abnormal. A vast amount of friction between teacher and pupil which now passes under the name of a necessary evil might be avoided by the teacher's understanding more of physiological psychology and of the laws of growth and development.

"School boards who are prevailed upon to undertake such an investigation are interested individually and collectively by that which they are undertaking through delegated power, and never fail to show their interest by the presence and active assistance of some of their number."†

The physical education movements of the century have largely been limited in their scope and local in their benefits, but such notable exceptions as are exemplified by the work of Jahn in Germany and of Ling in Sweden afford encouragement for the undertaking of broader and deeper plans of organization throughout states, sections and entire countries. The time seems ripe for far-reaching and more definite methods of propagation of systematic physical education. By the growing conviction that our greatest need—state, national, and international—along physical education lines is this breadth and definiteness of plans for organization, I am led to enlarge upon the statement in the former paper and to outline briefly my conception of best methods of the propagation of physical education throughout a state, as based upon my experience in the introduction of these methods in Nebraska.

Various features of the general plan of work have been in operation in Boston, Chicago, Kansas City, St. Louis, and other leading cities of the United States. Very successful effort has been made in these cities toward the perfection of consistent systems of physical exercise for public schools, and valuable statistical work has been done in various places. It has remained for Nebraska to attempt the combination of the various successful

† Excerpt from "Anthropometric Studies in Nebraska," by the writer, an address delivered before the Physical Education Section of the National Education Association. Los Angeles. Cal., U. S. A., July 12, 1899.—"American Physical Education Review," March, 1900.

methods employed elsewhere into one consistent scheme, and to add something in the way of method and of fact. For the training of physical directors and teachers, a normal training course in physical education, requiring two years' study, has been introduced into the curriculum of the University of Nebraska; a district society of the A. A. A. P. E., the Physical Education Section of the Nebraska State Teachers' Association, has been organized, which holds annually a meeting for the discussion of live topics; a complete set of anthropometric tables, showing the type or form for each height of each sex and age from five years to sixteen, has been compiled upon the basis of the measurements of over 12,000 children in Nebraska and has been published for use in public schools. These tables will be accompanied by a manual giving full explanation of the basis and use of the tables, to be published at an early date. But the most important thing which has been done for the state along physical education lines consists in the propagation of a broader ideal of the scope of the subject, in the inculcation of an eclecticism which would appropriate the best of the experience of others and bring each item of that experience into a homogeneous whole in order to form a complete scheme of propaganda and of successful methods of work.

There is little difference of opinion as to the urgency of the need of physical education in the public schools. Most of us believe that during the period of rapid growth systematic exercise will do more for the physical organism in one year than in two or three years after the university age is reached. What we need is that the careful oversight afforded to university students should be extended to the lowest school grades. It is even more important that careful physical examinations, prescription of exercise, and regular training should be employed for children than for university men and women. Regular hours should be set apart each day for systematic exercise. This training, whether indoors or out, whether recreative or gymnastic, must be hygienic rather than educational. It must be given regularly even if it must be carried on in hall-ways or in school rooms, but ultimately each school must possess a gymnasium as well as a roomy, well-equipped playground. Hours must be set apart for special corrective work adapted to weak or diseased children. A physical director must be provided for each city to supervise the character and amount of exercise given. All teachers must have received careful instruction in this subject along with the rest of their normal school training. Physical examinations should occur at the beginning of the year to determine development and prescription of suitable exercise, and at the close to reveal improvement. These examinations should be carried on by the physical

director with the assistance of teachers of each school. The development of each pupil should be plotted graphically upon anthropometric tables, by the teachers of each room or by a special assistant of the physical director, and sent home to parents. Special cases of abnormal development revealed by this graphical representation should be reported to the director, careful diagnosis made, and exercise prescribed which is adapted to correct the defects. The director should see that no child passes to a higher grade whose physical efficiency does not warrant the expectation that he will be able to carry the mental work of that grade without overstrain. Careful supervision must be given to athletic games, special examinations and training must be given in order to avoid needless injuries, and gentlemanly conduct and clean sport must be secured by the enforcement of correct amateur regulations. This can be insured only by the perfection of suitable governing organizations. The directors of physical training, whether of hygienic gymnastics or athletics, or both, should be trained at one central institution in order that one common system may prevail throughout the state. Regular conferences must be held by directors and teachers for the discussion and improvement of methods.

All these things are desirable, are even ideal, but are they practicable? It is sufficient to answer that most of them have been realized singly and successfully in some part of the country. They have been realized wherever there was sufficient interest on the part of an individual or group of individuals to father the scheme and bring it to a successful issue. It is true that for the accomplishment of all that has been outlined in this plan vast sums of money would be required, greater amounts than are now spent in places on the whole school system. It is true that men, even good business men so called, are of the opinion that all this stir about physical education is needless; that the only body-building a boy needs is a wood-saw (but they do not see to it that he gets the wood-saw regularly); that careful supervision of recreative games is a waste of time; that their boys can play without extraneous help as they themselves did, and that after all play is a matter of secondary importance; that girls need only to *exist* at home as their mothers did. They forget the change in all conditions of life, the labor-saving devices, the specialization of the age, which remove largely the necessity for varied forms of labor, which, in fact, leave very few of the "household chores" of a generation ago; they overlook the depleted vitality which comes down to their children through their own reckless expenditure of energy in the mad whirl and grind of business. These men are on the school boards; they hold the purse strings and control the physical policy of the city schools.

If nothing is done, it must be because they do not believe in it. If play-grounds are sold off to lighten taxes, or if they are left unprovided, it must be that they are not considered necessary. But public sentiment can obtain anything which it chooses to demand from civil authority. The fault is with public sentiment after all.

How can physical education reforms be brought about? By those agencies which are best calculated to influence the masses directly. The people must be interested immediately and by concrete facts and local illustrations. There is nothing which is calculated to arouse as deep an interest in physical education on the part of all classes and conditions as the physical examination of the children of a city or state. The attention of children, parents, teachers, principals, superintendents, and school boards is directed definitely toward one thing,—development. An indellible impression is the result.

"The best method of securing the co-operation necessary to the carrying out of such an investigation of the growth and development of children is through the organization of a local Physical Education Society. Co-operation means strength."* Present the claims of physical education and the results and advantages of the physical examination of children in large cities elsewhere. Organize local societies in the larger cities of the state, then a district society for the whole state which shall hold an annual meeting in connection with the State Teachers' Association. Bring into this society the state, county and city superintendents, principals of high and grammar schools, teachers, members of the school board, leading physicians, physical directors of colleges and universities and other professors, German turners, Y. M. C. A. and Y. W. C. A. physical directors, and all others interested in physical work. It is not difficult to interest these people if you have something practical and tangible with which to do it. From among all these different sources may be found assistants for the physical examinations, advice in the execution of all technical matters, medical or mathematical, the scientific ability for the presentation of results before representative people, and the energy and executive ability to prosecute the investigation thoroughly. By the use of teachers as assistants in minor measurements and as recorders, a very few skilled observers may accomplish a large amount of work in a few days. Under the auspices of the Statistical Committee of the organization so formed, and if possible with the supervision of the Director of Physical Education in the State University, begin the investigation of the growth of children in the state by examinations in the largest cities.

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* Anthropometric Studies in Nebraska.

"The matter of measurement is very much more expeditious than is the calculation of results. Ten afternoons of from two to three hours each were necessary for the measurement of 2,500 children in Lincoln schools, with two sets of instruments, taking two rooms at a time. With one set of instruments and one corps of observers, 10,000 were examined in Omaha within four weeks. With the proper organization of forces, these measurements can be taken accurately at the rate of two and even three children each minute."* In Lincoln over 300 children were measured within two hours through the use of two sets of instruments working in separate rooms. Any school however large can with proper management be finished in one day.

It may be well to indicate the method by some explanation from the blanks employed. Four blanks were used.—Form A. for females, Form B. for males, Form C. for parents and Form D for observers. They were modified from Dr. Porter's forms employed in the measurement of St. Louis children. In the selection of measurements for this preliminary examination in Lincoln and Omaha two ideas were allowed to govern, economy of time in taking the measurements and the intrinsic value of individual measurements in determining vitality. It was not found practicable to take tests of eyesight and of hearing the first year, important as they are, because of lack of expert examiners and of time for such careful work; these tests together with certain tests of strength should be taken at the first subsequent examination in every school, as they are exceedingly valuable. All the trunk dimensions were secured, because from these it is possible to estimate very accurately the relative vitality of individuals, and most of these measurements can be taken without much preliminary training by the average teacher.

The blanks are of manilla cardboard, preferably tagboard, each form of a different color. The cardboard is superior to paper for use in statistical work, as well as for recording. Blue, and other dark colors have been found less satisfactory than the lighter colors, light brick red, plain white, and straw. Ink is best for recording, and fountain pens are almost an essential. The recorder should be instructed to place the figures close to the quality measured. Older children may be employed as recorders, but this was not found absolutely satisfactory. Form B. for males is the same as form A. for females except in color. These forms afford room for thirty-three observations. The name of the pupil and the age observations, Nos. 4 and 6, are placed on the card by the teacher of the room examined, and the card is given to the child before he leaves his seat. Numbers 19 to 32 inclusive are

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* **Anthropometric Studies in Nebraska.**

taken next by the observers. Nos. 1, 2, 3, 17, 18, and 33 are then filled in by the teacher or teachers of the room; and blank C., containing questions to parents, is sent home with the child and request made that it be returned by the following morning. The next day numbers 5 to 16 inclusive are filled in from the parents' blank by the teachers, and the whole number of blanks turned over to the Statistical Committee or physical director in charge.*

To insure expedition as well as accuracy two rooms should be set apart for examinations, one for boys and one for girls; eight observers, eight recorders, and one attendant are required for each room, women being preferred for most of the measurements of girls. It is best to begin with the kindergarten and take the school room by room from the lowest to the highest grades; the children of each succeeding room should be brought in each time before the weight of the preceding one is finished. The instruments should be placed in line according to the order of measurements on the blank. One observer and one recorder should be placed with each instrument, the first taking simply weight; the second, height standing and height sitting; the third, span of arms; the fourth, breadth of head, breadth of chest, and breadth of waist; the fifth, depth of chest; the sixth, girth of head and the two girths of chest; the seventh, lung capacity; the last, strength of forearm right and left. The children of a room should be required to unlace their shoes at their seats and each be given a blank with his name on it. They are then to be marched in a line to the first observer at the scales, the shoes removed and carried by an attendant to the foot of the line of observers. The child hands his blank to the first recorder and passes from observer to observer until all the measurements are taken. Greater accuracy as well as speed is secured by this division of labor. If the slowest observer in a group takes his data at the rate of one and a half individuals per minute, 180 children will be examined in the two rooms during one hour.

Anthropometric tables showing the type or norm for each height of each age and sex should be computed for use in the schools of the state. This work is laborious at best, therefore some suggestions as to method may be acceptable. Use the mean for the type. It is more accurate than the average and is much easier to calculate. Preserve the calculations of the mean in blank

* It has been found more satisfactory in some of our later examinations at different points in the state to have the pupil fill out before examination the date of birth and all the information which he can give of that which is expected to be secured through the card sent to parents, then the measurements taken will be of some value in case the parents' blank is not returned. Something like 4% of the 10,000 individual records of Omaha school children were rendered valueless for statistical purposes by the failure in return of the parents' blank.

ANTHROPOMETRIC TABLE I

FOR GIRLS SEVEN (7) YEARS OF AGE

PHYSICAL TYPE FOR EACH HEIGHT OF AGE, AND VITALITY COEFFICIENTS.

(Compiled from the measurements of five hundred and thirty-four Omaha school girls.)

Number of Observations	Per Cent.	Height (centimeters)	Weight (Kilos)	Lengths (Cent.) Height Sitting	Span of Arms	Breadths (Cent.) [illegible]	[illegible]	[illegible]	Depths (Cent.) Chest	Girths (Cent.) [illegible]	Chest Expansion	Strengths Lung Capacity	[illegible]	[illegible]	Coefficients	R H C—Respiratory-Height Coefficient; V C—Vitality Coefficient; O S H C—Organic Strength-Height Coefficient	
		116.1	21.00	66.96	113.5	14.21	19.96	19.26	12.57	52.86	3.12	.63	9.66	11.90			
		114.1	20.44	65.86	116.0	14.17	19.26	19.00	12.60	52.06	3.00	.59	9.00	11.00			
	75		24 [illegible]	68 41	125 [illegible]	14 [illegible]	19 [illegible]	17 [illegible]	[illegible]	[illegible]	6 [illegible]	1 25	11 11	10 [illegible]	[illegible]	R H C	
67	M	121	22 64	67 64	120 [illegible]	14 29	19 01	16 78	12 75	51 96	5 45	[illegible]	9 50	9 13	5 [illegible]	V C	
	25		21 [illegible]	[illegible] 67	117 70	14 [illegible]	18 41	15 81	12 21	51 [illegible]	4 [illegible]	[illegible]	7 [illegible]	7 [illegible]	126 21	O S H C	
	75		25 [illegible]	[illegible]	119 79	14 65	19 65	17 64	12 [illegible]	52 11	5 74	1 07	10 [illegible]	9 45	[illegible]	R H C	
60	M	119	23 44	65 06	117 06	14 29	15 86	17 00	12 46	51 25	5 00	93	9 16	7 20	4 77	V C	
	25		21 19	66 67	114 37	13 79	17 [illegible]	16 3[illegible]	11 [illegible]	[illegible]	4 25	79	7 40	4 06	122 21	O S H C	
	75		21 70	65 75	116 44	14 [illegible]	19 10	17 65	12 [illegible]	54 [illegible]	5 77	1 12	9 91	10 17	[illegible]	R H C	
64	M	117	20 78	64 38	114 50	14 22	18 46	16 67	12 47	50 65	5 02	90	8 70	8 20	5 06	V C	
	25		19 30	[illegible] 01	112 06	13 [illegible]	17 [illegible]	15 [illegible]	11 94	49 71	4 27	[illegible]	7 45	6 34	120 36	O S H C	
	75		21 [illegible]	64 [illegible]	114 65	14 65	[illegible]	[illegible] 21	12 10	[illegible]	5 71	1 04	5 70	9 72	[illegible]	R H C	.017
76	M	115	20 76	65 73	11[illegible]	[illegible]	18 56	17 05	12 63	51 23	4 65	[illegible]	6 06	6 92	4 49	V C	2.36
	25		19 [illegible]	62 37	110 20	13 [illegible]	18 [illegible]	15 79	12 11	[illegible]	2 56	74	5 17	5 65	124 [illegible]	O S H C	[illegible]
	75		20 [illegible]	6[illegible]	113 19	14 47	18 76	[illegible]	12 26	51 [illegible]	4 92	[illegible]	[illegible]	7 51	[illegible]	R H C	.016
85	M	115	20 10	62 8[illegible]	111 19	14 19	18 24	16 63	12 62	50 61	4 03	75	7 12	5 87	3 31	V C	2.20
	25		19 [illegible]	61 36	109 19	13 [illegible]	17 92	[illegible]	11 [illegible]	[illegible]	[illegible]	[illegible]	5 04	4 [illegible]	122 67	O S H C	1376
	75		20 51	65 51	111 13	14 [illegible]	18 [illegible]	17 45	12 20	54 04	5 [illegible]	1 02	8 74	6 [illegible]	[illegible]	R H C	
72	M	111	19 65	62 19	[illegible] 31	14 20	18 10	16 53	12 45	50 53	4 60	85	6 88	5 61	4 23	V C	
	25		18 79	[illegible]	107 45	13 34	17 [illegible]	15 61	11 97	50 12	3 67	[illegible]	5 02	4 64	120 34	O S H C	
	75		19 47	62 11	109 [illegible]	14 45	18 10	17 85	12 [illegible]	51 40	5 20	91	7 [illegible]	6 [illegible]	[illegible]	R H C	
52	M	109	18 42	61 22	107 00	14 10	17 80	16 40	12 27	50 67	4 27	80	5 85	4 99	3 65	V C	
	25		17 37	[illegible]	104 94	13 73	17 21	16 25	11 [illegible]	49 94	3 26	[illegible]	4 04	3 [illegible]	117 64	O S H C	
	75		18 57	61 49	106 [illegible]	14 20	18 65	17 15	12 75	56 77	6 05	80	7 24	5 51	[illegible]	R H C	
46	M	107	17 38	60 35	104 33	14 10	17 76	16 40	12 23	50 [illegible]	4 07	67	5 90	4 94	3 06	V C	
	25		16 19	59 21	102 04	13 [illegible]	17 67	15 [illegible]	11 71	49 20	3 05	54	4 30	4 [illegible]	117 [illegible]	O S H C	
Total 534		114 25	19 71	65 71	112 01	14 [illegible]	18 42	16 [illegible]	12 [illegible]	50 [illegible]	4 70	[illegible]	7 45	6 [illegible]	4 27	Mean measurements for the age.	

books rather than on separate sheets of paper and use the method of distribution originated by Dr. Gulick, now of Brooklyn, N. Y. To obtain the ideal 25% and 75% lines, use a corrected average deviation from the mean instead of a probable deviation calculated from the average as a basis. They are practically the same even when calculated on the basis of 50 to 80 individuals. Comparison made between the probable deviation and corrected average deviation for various qualities of girls age 7 in the table given below revealed that the difference was approximately .04. In the larger groups containing all the individuals of the same age the difference was inappreciable. This corrected deviation is obtained by taking the half sum of +D and —D.

If the child shows a deviation from the mean of more than ±D a special physical diagnosis should be made by the director before he or she is advanced to a higher school grade. It is very evident that cases of poor development and of atrophy require special corrective work and occasionally certain limitations as to amount and character of study. It is no less true that over-development may require as careful medical attention, especially if the height indicates too rapid growth or the head is abnormally large.

The foregoing Anthropometric Table for Girls of 7 Years shows the physical type for each of eight heights for the age, also three Vitality Coefficients. A division of the total number of individuals of the age into eight groups ranging from 107 to 121 centimeters in height was found to insure homogeneity and to provide groups sufficiently large to produce a mean for each height sufficiently accurate for all practical purposes. This table illustrates the method of examination twice yearly, once in the fall as near as possible to the beginning of the school year and again in the spring toward the close of the school year. These examinations should be either during the first and last months of the school year in order to make a comparative showing of the growth of the child during the school months and during vacation, or exactly six months apart in order that the growth during the two halves of the year may be placed side by side. The two sets of measurements plotted on the above table represent the growth during six months of the school year. This case shows development, but in many qualities there has not been an increase of half the mean annual growth to be expected for this age.

On Table II. of Boys of 9 Years is plotted the mean measurements of the total of 546 boys of this age, given in the bottom line of this table. They are compared with measurements of boys nearest the mean height, i. e., with those 126 to 128 centimeters in height. They are prevailingly smaller in their development

ANTHROPOMETRIC TABLE II

FOR BOYS NINE (9) YEARS OF AGE

PHYSICAL TYPE FOR EACH HEIGHT OF AGE, AND VITALITY COEFFICIENTS.

(Compiled from the measurements of five hundred and forty-six Omaha school children.)

				Lengths (Cent.)		Breadths (Cent.)			Depth (Cent.)	Girths (Cent.)		Strengths			Coefficients		
Number of Observations	Per Cent.	Height (centimeters)	Weight (Kilos.)	Height Sitting	Span of Arms	Breadth of Head	Breadth of Chest	Breadth of Waist	Chest	Girth of Head	Chest Expansion	Lung Capacity (litres)	Strength of R. Forearm (Kilos.)	Strength of L. Forearm (Kilos.)	R H C—Respiratory Height Coefficient; V C—Vitality Coefficient; O S H C—Organic Strength-Height Coefficient		
	75		29 [illegible]	72 [illegible]	130 04	14 94	21 13	19 [illegible]	14 [illegible]	[illegible]	8 [illegible]	1 65	17 67	15 [illegible]	[illegible]	R H C	
79	M	132	28 26	71 39	132 00	14 61	20 53	19 66	12 62	53 06	7 66	1 42	15 56	14 01	12 54	V C	
	25		26 78	[illegible] 26	129 [illegible]	14 [illegible]	19 97	18 34	12 [illegible]	[illegible] 16	6 41	1 30	13 65	12 [illegible]	145 [illegible]	O S H C	
	75		[illegible]	71 55	132 34	14 29	21 [illegible]	19 29	13 78	[illegible] 79	7 [illegible]	1 [illegible]	15 65	15 51	677	R H C	
58	M	130	27 26	70 25	129 40	14 58	20 43	18 53	13 87	53 06	6 75	1 49	12 90	13 62	10 76	V C	
	25		26 12	68 55	126 66	14 27	19 81	17 01	12 78	52 31	5 [illegible]	1 22	12 11	11 70	120 78	O S H C	
	75		26 85	71 16	129 47	15 [illegible]	20 [illegible]	19 41	14 01	54 06	8 54	1 56	16 [illegible]	14 [illegible]	[illegible]	R H C	
81	M	128	26 57	69 20	126 90	14 60	20 33	18 82	13 28	52 98	7 23	1 39	14 01	12 99	11 16	V C	
	25		25 49	65 70	124 [illegible]	14 [illegible]	19 67	17 66	12 26	51 80	5 26	1 [illegible]	11 72	11 [illegible]	141 [illegible]	O S H C	
	75		26 77	69 76	126 77	14 72	[illegible] 34	16 [illegible]	14 01	52 [illegible]	7 81	1 56	15 27	14 85	671	R H C	.068
80	M	126	25 54	68 67	125 56	14 43	19 80	18 13	13 [illegible]	53 [illegible]	6 56	1 35	12 15	12 75	9 72	V C	9.18
	25		24 31	67 38	123 [illegible]	14 14	19 26	17 34	12 49	51 34	5 81	1 18	11 04	10 91	125 26	O S H C	135.4
	75		18 79	68 41	126 [illegible]	14 72	20 25	18 80	14 10	[illegible]	7 10	1 47	14 04	13 [illegible]	[illegible]	R H C	
67	M	124	24 70	67 28	124 50	14 61	19 72	17 70	13 36	52 22	6 58	1 31	12 25	11 42	9 46	V C	
	25		[illegible]	66 15	122 96	14 09	19 09	16 80	13 50	51 11	5 57	1 15	10 46	9 46	125 66	O S H C	
	75		25 07	67 [illegible]	124 97	14 67	[illegible] 20	18 65	13 37	52 31	7 42	1 47	13 [illegible]	12 70	[illegible]	R H C	
60	M	122	24 07	67 02	122 15	14 54	19 72	17 42	12 73	52 32	6 33	1 32	11 72	11 34	8 97	V C	
	25		[illegible] 07	66 11	120 [illegible]	14 21	19 27	16 41	12 06	51 [illegible]	5 28	1 17	9 34	9 01	120 10	O S H C	
	75		23 72	67 02	121 14	14 81	19 20	16 01	13 [illegible]	[illegible]	6 85	1 24	13 [illegible]	11 40	[illegible]	R H C	
57	M	120	22 72	65 80	119 06	14 45	19 19	17 10	13 12	52 50	5 20	1 00	11 53	9 92	6 80	V C	
	25		21 72	64 76	116 [illegible]	14 [illegible]	19 40	16 10	12 26	51 56	4 45	[illegible]	8 70	6 45	120 12	O S H C	
	75		22 93	65 [illegible]	118 25	14 [illegible]	19 54	16 17	13 42	[illegible] 07	4 04	1 [illegible]	12 21	11 70	[illegible]	R H C	
63	M	118	21 49	64 48	115 94	14 45	19 00	17 36	12 80	51 96	5 00	1 10	10 06	10 21	7 42	V C	
	25		20 15	62 97	112 83	14 14	18 46	16 85	12 34	51 05	4 00	1 00	9 11	8 [illegible]	127 26	O S H C	
Total 546		125 86	25 07	68 80	124 70	14 15	19 78	18 04	13 21	52 [illegible]	6 55	1 31	12 30	11 78	9 17	Mean measurements for the age.	

and *very evenly so,* therefore one is led to conclude that boys of exactly mean height have a tendency to all-around mean development. This opinion is strengthened by their close conformity to the mean of a group containing only those 125 to 127 centimeters in height.

The fact that the measurements for the mean of the age follow so nearly those of the group 124-126 is evidence that the mean for the age falls below the mean development of boys of the mean height of the age, therefore the typical measurements for those do not represent the typical measurements of individuals of the mean height of the age and can not be taken as the standard of symmetry for that height. Calculations from larger groups will, I believe, sustain this conclusion. The fact that the binomial curves of distribution are often irregular and unsymmetrical for an age, but comparatively symmetrical in this grouping by various heights for the age, is added evidence of homogeneity in the height groups and therefore of the possibility of obtaining through their use a more perfect type or norm. It is clear upon other grounds that there is a certain physical type for each height of each age; that height, whether the product of heredity, environment, or disease, is a fixed obstacle in the way of a satisfactorily plotted indication of improvement on any form of percentile chart published heretofore (indeed, so far as I know, there has not been any complete chart, even percentile, published for use in schools; some have appeared in scientific papers such as those by Dr. Porter of St. Louis); that the representation of the continuous development of giants and dwarfs of any age, indeed of all individuals outside of $M \pm D$ is practically impossible on the ordinary percentile chart. The charts herewith presented, giving approximately the type or norm for each height of each age and sex, were originated to meet the need for a practicable working scheme for the graphical indication of the development of children of all ages. It is evident that a set of percentile charts calculated for each height of each age and sex would meet exactly the need from the purely scientific point of view, but the calculation, printing, or use of such tables would not be a practicable thing for any state. Besides, it is not necessary for corrective purposes to present graphically more than abnormality (departure from the mean of more than the probable deviation), and extreme abnormality (departure beyond the 10% and 90% lines). If the measurements of 500,000 individuals were accessible, it would be of more practical benefit to the state to have perfect standards of symmetry calculated according to the method employed in these tables than to attempt to secure a complete set of percentile tables, for the latter would be too expensive of time and money for ordinary use.

A few words upon the method of plotting the tables may be

conducive to quicker and more satisfactory reference. 1st On the Age Tables, the measurements of the individual are intended to be written in the spaces left between the ages; on the Height Tables, in the blank spaces left at the top. 2d. In plotting on the Age Table (Table IV.), the child is reckoned as belonging to the group which represents his nearest birthday; in plotting on the Height Tables, he belongs to the group opposite the lower number of those two between which his individual height falls. 3d. The mean, 25%, and 75% lines fall exactly in the middle of their respective spaces. Plot any measurement included in M ±D from the middle point of the mean space to the middle point of spaces above and below; that is to say, the space between the tops of the figures for the mean and those for the 75% line should include the points to represent anything from 50% to 75%, and the space between the tops of the figures for the mean and the 25% line the points to represent anything from 50% to 25%. 4th. The points are placed to the left of the figures. 5th. The upper line of the two enclosing 75% measurements may be regarded as the 90% line, the lower line of the two enclosing the 25% measurements may be regarded as the 10% line. Experimental calculations reveal that the difference between the 25% line and the 10% line, as well as the difference between the 75% line and the 90% line, is constantly a small fraction less than the corrected average deviation. 6th. Hence any measurement differing from the 25% line below, or from the 75% line above, by the amount of the average corrected deviation requires that the point representing it be placed outside of the lines enclosing the 25% or 75% measurements, to indicate extreme abnormality. 7th. The Age Table is intended to record the comparative growth of the child each year for twelve years and to afford comparison with other children of the age. Similar tables for University use containing *all* the standard physical qualities, compiled from University measurements, taken with clothing removed, for ages 16 to 30 will be prepared as soon as the requisite number of measurements are secured. Thus the whole period of school life will be covered.* 8th. The Height Tables record the development of the individual for the instruction of the physical director, the student, and parents in their effort to secure forms of corrective work adapted to individual needs. Departure from the mean measurements of each height indicates departure from the type or norm, and approximately departure

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*** In order to provide standards for all public schools ages, including the older pupils in high schools, further examination in high schools have been undertaken this fall (1900) and anthropometric tables are being calculated for ages 17 to 20. The whole period of public school life will be regarded as from five to twenty years, and as overlapping the university age five years.**

from symmetry. 9th. The formula for the Respiratory Height Coefficient (R.H.C.) is:

$$\frac{\text{Chest Expansion} \times \text{Lung Capacity}}{\text{Height}}$$; for the Organic Strength Height Coefficient (O.S.H.C.) is:

$$\frac{\text{Height Sitting} \times \frac{1}{2}(\text{Breadth of Chest} + \text{Breadth of Waist}) \times \text{Depth of Chest}}{\text{Height}}$$

for the Vitality Coefficient (V.C.) is: R.H.C. $\times$ O.S.H.C. For convenience these coefficients are placed on the tables in the order R.H.C., V.C., and O.S.H.C. upon the 75%, 50%, and 25% lines respectively.

The Respiratory Height Coefficient shows the percentage of respiratory strength or efficiency for each centimeter of height. Total respiratory strength is taken to be the product of flexibility of the thorax by the capacity of the lungs. To measure the respiratory efficiency is the most important means of determining vitality from the point of view of function.

The Organic Strength Height Coefficient represents the percentage of capacity and power of the vital organs of the trunk. It is approximately the ratio of the solid cubical contents of the trunk to the height in centimeters. Sitting height may not at first sight appear to be an accurate dimension to be used in computing the cubic contents of the trunk because, in addition to actual trunk length, it comprises length of head and neck. It would appear more accurate to employ the actual trunk length, but it is entirely impracticable to obtain this measurement accurately without removal of clothing and the aid of expert examiners. Since the length of head and neck is practically a constant quantity, greater accuracy than that secured by the use of Sitting Height is not essential. For statement of an absolute physical ratio it would be better to use the trunk length, but for the comparative statement of percentage of individual vitality for purposes of diagnosis, the use of Sitting Height produces an Organic Strength Height Coefficient of sufficient accuracy.

The Vitality Coefficient is equivalent to the product of the total exhibition of respiratory strength by the total strength of the vital organs as indicated by their bulk. It is a merging of all the indices of the capacity for endurance into one. It is generally conceded, and in fact has been demonstrated, that vitality varies in a direct ratio with each one of the physical qualities used in the calculation of these coefficients, lung capacity, chest expansion, height sitting, breadth of chest, breadth of waist and depth of chest; then the combination of all these qualities should produce the very most satisfactory index of vital strength.

Table III. represents graphically some abnormal extremes in vitality for the age, compared with an individual of normal

TABLE III.

Number of Observations	Per Cent.	Height	Weight	LENGTHS: Height Sitting	LENGTHS: Span of Arms	BREADTHS: Breadth of Head	BREADTHS: Breadth of Chest	BREADTHS: Breadth of Waist	DEPTH: Chest	GIRTHS: Girth of Head	GIRTHS: Chest Expansion	STRENGTHS: Lung Capacity	STRENGTHS: Strength of R. Forearm	STRENGTHS: Strength of L. Forearm	COEFFICIENTS: R H C—Respiratory Height Coefficient; V C—Vitality Coefficient; O S H C—Organic Strength-Height Coefficient		
		131.5	28.00	72.00	131.5	14.42	21.60	18.40	15.04	52.00	8.10	2.90	11.34	14.06			
-	—	126.7	25.23	68.20	125.2	14.60	19.44	17.70	13.10	53.10	7.00	1.54	12.61	11.34			
	75		[illegible]	[illegible]	[illegible]	14 73	[illegible]	[illegible]	14 65	[illegible]	[illegible]	1 40	[illegible]	[illegible]	[illegible]	R H C	
77	50	130	25 61	71 20	130 27	14 40	20 11	18 10	13 22	53 22	6 24	1 20	12 55	11 37	6 21	V C	
	25		[illegible]	[illegible]	[illegible]	14 20	16 37	17 30	[illegible]	51 44	5 15	1 15	[illegible]	[illegible]	[illegible]	O S H C	
	75		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7 20	[illegible]	14 07	[illegible]	[illegible]	R H C	[illegible]
80	50	130	27 06	70 16	[illegible]	[illegible]	19 96	18 03	13 06	[illegible]	6 06	1 18	[illegible]	11 22	7 21	V C	[illegible]
	25		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4 20	[illegible]	[illegible]	[illegible]	[illegible]	O S H C	[illegible]
	75		[illegible]	[illegible]	[illegible]	14 75	[illegible]	[illegible]	13 71	[illegible]	6 20	[illegible]	[illegible]	[illegible]	[illegible]	R H C	
70	50	128	25 90	65 22	125 57	14 41	19 56	17 60	13 06	51 07	3 57	1 10	11 06	11 12	6 05	V C	
	25		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12 41	[illegible]	4 25	[illegible]	[illegible]	[illegible]	[illegible]	O S H C	
	75		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11 70	[illegible]	R H C	.974
74	50	128	25 23	[illegible]	123 76	14 40	19 57	17 40	12 91	53 19	5 70	1 10	10 26	9 06	6 06	V C	9.69
	25		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	O S H C	[illegible]
	75		[illegible]	[illegible]	[illegible]	14 72	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	R H C	
65	50	124	23 85	67 30	123 05	14 41	19 22	17 82	12 65	51 35	5 85	1 12	10 07	9 04	6 50	V C	
	25		[illegible]	[illegible]	[illegible]	14 10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	O S H C	
	75		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	R H C	
73	50	128	23 24	65 03	120 07	14 37	10 04	17 18	12 70	51 47	5 50	1 07	9 42	9 22	6 00	V C	
	25		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12 12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	O S H C	
	75		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	R H C	.016
80	50	120	22 76	65 67	[illegible]	[illegible]	19 06	17 18	13 00	51 00	4 00	1 06	9 27	9 00	5 41	V C	1.73
	25		21 17	64 64	[illegible]	[illegible]	[illegible]	16 44	[illegible]	[illegible]	3 44	[illegible]	[illegible]	[illegible]	[illegible]	O S H C	1.311
	75		[illegible]	[illegible]	[illegible]	14 54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	R H C	
75	50	118	21 34	64 50	116 03	14 22	16 86	17 19	12 84	51 12	5 20	1 01	9 19	6 73	5 52	V C	
	25		[illegible]	[illegible]	112 97	[illegible]	[illegible]	[illegible]	11 65	[illegible]	[illegible]	[illegible]	3 15	[illegible]	[illegible]	O S H C	
Total [illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 14	[illegible]	[illegible]	[illegible]	Mean measurements for the age.	
		122.0	23.30	63.30	117.40	14.30	19.20	16.30	12.38	51.51	[illegible]	[illegible]	8.47	6.50			

ANTHROPOMETRIC TABLE IV

for BOYS FIVE TO SIXTEEN (5-16) YEARS OF AGE

PHYSICAL TYPE FOR EACH AGE, AND VITALITY COEFFICIENTS.

(Compiled from the measurements of five thousand four hundred and seventy-six school children.)

Direct
to left of fig
lower line o
he average c

	75	29 96	135 11	72 26	134 61	14 90	21 01	19 24	14 04	53 29	8 24	1 71	17 24	16 39	079	R H C	

ply by .393; kilo

muscular development but of superior respiratory strength. One is for the age a veritable dwarf, the other as truly a giant. The dwarf has about one-fourth of the normal vital strength, the giant over three times the normal. The vitality coefficient of the giant is about fourteen times that of the dwarf. The same general ratio between the two extremes is preserved in age thirteen.

The age table furnishes a means of determining the semi-annual growth of a child from the beginning of his school life. (For illustration of method, see Age Table IV.) On this table is shown the development of a child twice each year from the time he entered school at five years of age until he left it at ten years of age.

They indicate the effect of the summer vacation upon growth during the six months which include it. (See Age Table IV, age 13.) Three measurements are given. The first was taken in the spring; the second, supposedly six months later, after the summer vacation; and the last, after six months of school work without regular exercise.

These anthropometric tables afford some conclusions of value,—
1. Symmetry is relative to mean height. That is to say, other things being equal, the nearer an individual approaches mean development in height the more nearly will he conform to an absolute standard of symmetry in his entire development. But there is a typical development and standard of symmetry for each height of each age, a standard which is attainable and to which the muscular development of the individual of that height may be made to conform very closely through the aid of regular systematic physical training.

2. These tables are therefore designed to show graphically the departure of an individual of any height for each age and sex from the norm and to indicate the character of corrective work required.

3. They are intended to show the period of accelerated growth for successive years of life and for different parts of the same year.

4. Through their use it is possible to gauge accurately the effect of different kinds of exercise upon various ages of children, and to perfect plans for the proper adaptation of exercise.

From the discussion in "Anthropometric Studies in Nebraska" the following statements are extracted: "Children of the same age and sex increase in mental efficiency according to the development of their various physical qualities, height, weight, etc. * * * And not only is it true that children of better physique are more advanced in school grades, but as a rule the percentage of their class standing increases with the advance in school grades and with their better physical development; e. g., the percentages for

boys of nine years averaged by grades are: Grade I, 82%; Grade II, 83%; Grade III, 84%; Grade IV, 89%. * * * It is not supposed that the figures given herewith are final for Nebraska. It is not claimed that they will not be changed slightly by future examinations, even if the physical type of Nebraska children in the meantime fails to change appreciably through the introduction of physical education into the public schools. But they are correct within one or two millimeters, as to bone lengths and girths, and within a fraction of a pound as to weight.

The purpose of this first general examination is to provide an approximate standard of the normal development for each age and sex. * * * After physical examinations have been introduced for a period of several years throughout the state and 100,000 or more individuals have been examined from various cities and schools, it will be time to anticipate obtaining conclusions of more absolute accuracy." It is hoped that within the next decade in many leading cities this form of examination without removal of clothing will have served its purpose and be superseded by a more thorough physical examination and diagnosis such as is afforded now in our leading universities, and that these anthropometric tables will be replaced by more extensive ones based upon net measurements. "Until such a time we may be content to use tables based upon the first examination of children of our own section, or else procure them from some state where the physical conditions are practically the same as in our own state."

The physical director for the state should not depend upon the initial physical examinations alone to interest people in physical education, nor is it enough to depend upon the example of successful methods of work in one or two cities. He must give the results of this investigation and of this experience to the people directly. They must be presented before the pupils, parents, and teachers immediately interested, before District Teachers' Associations and State Teachers' Associations, before the State Physical Education Society, State Medical Association, State Academy of Sciences, and other learned societies. A definite system of propaganda must be inaugurated with a definite head who shall be held responsible for its execution. The physical director of the state university or of the strongest university in the state is best adapted to become this head, and his work in the university should be so arranged as to render him available. The propaganda will then assume its proper relations to the whole educational scheme and take place under the name of University Extension. In this capacity the physical director will be responsible for the presentation of results throughout the state;

as Chairman of the Statistical Committee of the State Physical Education Society, he will be held responsible for the compilation of statistics, and the examinations from various cities ultimately be filed with him; as director of physical education in the university and in the state he will press the introduction of systematic exercise in schools, advise in the adaptation of the best forms of exercise for different ages, and determine the system taught in the "Course in Physical Education" offered by the University to teachers for the state. Additional interest in systematic training may be created among students by the organization of a State Intercollegiate Athletic Association and a State Interscholastic Athletic Association, and by the holding of periodic sectional and state meets. Such definite organization induces a supervision which is wholesome for the promotion of clean athletics as well as for the encouragement of regular systematic training essential to success in such sports.

In brief, for the Propaganda of Physical Education throughout a State, have a consistent plan and make some one responsible for its execution.

Summing up the conclusions as to propaganda which appear worthy of closing mention, we have:

1. Preliminary physical examinations of the children of a city taken for the purpose of securing approximate standards of growth and development will promote a solid initial interest in any city; are practicable for any city; are valuable for the indication of the norm, though taken without the removal of clothing; are sufficiently exact to become a trustworthy guide in corrective work; form a basis and an incentive for later and more scientific investigations by experts.

2. Regular physical examinations of children are practicable for any school twice a year since they can be taken by the teaching force in one afternoon with sufficient instruments under proper supervision. Through the use of $M \pm D$ and the Vitality Coefficient they reveal to the teachers children who require attention from the physical director or a medical expert.

3. As soon as practicable each city should be provided with a physical director who shall have charge of the general hygienic work in city schools, determine the character and quantity of work to be given by teachers, and train them, where deficient, in the exercises to be given. He should be thoroughly equipped also to exercise the same supervision over all forms of recreative work on the playground, including what is generally known as athletics. He should give especial attention to corrective work for the weak and diseased and examine all cases noted by teachers, make a thorough diagnosis and prescribe exercise where the indications are that it will prove

beneficial, and advise the parents where the aid of a family or city physician is needed. He should personally conduct the semi-annual physical examinations with the aid of competent teachers and medical assistants.

4. Special investigations should follow during the year or occur at the time of the semi-annual examinations as soon as skilled assistants can be secured by the director. Examination of eyes and ears, special cranial measurements of anthropological value, strength tests for the legs, back, and thoracic walls, and heart and lungs diagnosis are most important among further examinations possible without the removal of clothing.

5. In cities where there is no physical training, introduce first general calisthenics, both free-hand and light apparatus work, into public school courses for one-half hour to one hour each day even if such exercise must take place in the hall-ways or school-rooms; in addition provide playgrounds and supervise the work on them carefully. As soon as the financial backing can be secured, provide a gymnasium with additional wholesome forms of exercise and have all forms of indoor gymnastics only in this room.

6. In order to provide carefully trained teachers in physical education throughout the state as demand is made for them, and also to secure a measure of uniformity in methods of training, a two or three year course in physical education should be introduced into the curriculum of the state university and the state normal school.

7. Physical education must become an integral part of the whole educational system. University Extension should become responsible for The Propaganda of Physical Education throughout a State.

IMPORTANCE OF MOVEMENT FROM THE PSYCHOLOGICAL STANDPOINT.*

I.—General Statement.

It is indispensable in order to determine in a complete manner the significance of physical education, and to define in a positive way its methods, to specify the functional relations existing between the activity of the muscles and that of the brain. The voluntary movements are regarded as direct manifestations of the centers of the region of Rolando considered as the essential motor centers.

In this conception the muscular activity would be the integral expression of the peculiar process originating in that part of the brain having for its sole mission the elaboration of the reactions, whilst all the other areas of the cerebral cortex would intervene in the generation of the sensations. This physiological theory must regard muscular work as entailing important consequences from the standpoint of the life of the muscle and of the general health, but it cannot give it a psychological significance of any importance.

Gymnastics, based upon this idea, will consider movements in their effects upon the physical state only; it will also study the role played by movement from the standpoint of the equilibrium of functions, therefore from the standpoint of the problem of mental overwork.

Thus understood, physical education has a considerable importance, and yet it leaves out of account a great mass of facts which widen notably its field of action and should sensibly modify its methods. In order to consider the problem from this point of view, it is necessary for us, in the first place, to recall the new physiological data which are contrary to those which we have stated above. We will point out then what are the consequences which it is necessary to infer from the standpoint of the aim and the method of the science of physical education.

II.—Physiological Bases.

1. The cortical brain centers—except, evidently, the centers of association—are all sensory-motor. The centers of the fissure of Rolando have not then the function of motor centers, as was formerly thought. At their level originate the sensations due to the action of the sense of touch, the muscular sense, the articular sense, etc., and there arise genuine cortical reflexes—the

* This article forms the sketch of a study which Dr. Demoor, of the University of Brussels, intended for the Congress of Physical Education held in Paris in 1900. Dr. Demoor was unable to present his paper at the Congress, but a friend presented the abstract, of which the translation is given here. Translated by T. D. Wood, M.D.

motor impulses which express externally the various kinds of muscular effort. The Rolandic centers are therefore the centers of the sensations tactile, muscular, etc., and of the reactions which they bring about.

2. Psychology proves the great importance, from the standpoint of psycho-genesis, of the tactile and muscular sensations. Among the sensory-motor centers of the cerebral cortex, the Rolandic center has then a major role to play in the building up of thought. Its importance is much greater than that of the centers of sight, hearing, smell and taste.

3. Thought, with the many forms which characterize it; volition, with the action of inhibition which prepares it, are essentially the functions of the centers of association. All of the elements of activity of these last areas are furnished, as we know, by the sensory-motor centers. The enormous functional value of the Rolandic centers makes evident the preponderating part taken by this region in the activity of the centers of association, either in the origin of thought or of volition. Experimental physiology and human pathology furnish numerous facts which justify this conclusion.

4. Recent physiological and anatomical researches demonstrate that the development of the cortical layer, in the course of the individual evolution of each of us, depends in very great degree upon the putting into action of the organs connected with the various centers. On suturing in a careful manner the eyelids of a young animal, the corresponding center of vision is made to preserve throughout the entire life an embryonic structure contrasting with the homologous center which is connected with the eye left open. In the same way, the cortical territory in relation with an extremity in which the nerve has been cut, remains in a rudimentary state if the operation was performed when the animal was very young. The pathological facts agree with those which we have just described. It is permissible to state therefore that the cortical neurons achieve their development under the incessant impulse of the stimuli which reach them.

5. Physiology proves also that nervous activity in that which is more arduous, and also in that which may have a greater complexity, does not suppose an increased metabolism in the central nervous system. It is associated with a general metabolism in which the nervous tissue has only a very small part; the psychical or nervous phenomenon appears essentially as the result of an exact distribution, adjusted by the nervous system, of the energy liberated by the organism.

III.—Effects of Movements.

Given the different physiological and psychological considera-

tions expressed above, and also the physiological laws known for a long time, we may state that:

1. Muscular work (exercise therefore) brings about a normal nutrition of the muscle and of the various organs of the body. It is one of the principal factors in the general health (we do not say the physical, for the multiple activities of the organism are too closely connected for it to be possible to continue the distinctions between physical, intellectual, and moral health which are often made).

An essential factor of the general health, it becomes by this very fact the primary condition of a regular generation of that bodily energy upon which depend the normal psychical evolution and the regular manifestation of thought.

2. Muscular work (consequently exercise) is the normal excitant of the Rolandic centers, considered as sensory centers. It is the cause of the generation in the brain of muscular and articular sensations, and often also of tactile sensation. Movement is therefore, with reference to the more important cortical centers, the only efficient stimulus; that is to say, capable of bringing about the regular development of the neuron and its normal morphological completion.

IV.—Physical Education—Principles of Its Methods.

One has always to consider movement (games, gymnastics, etc.) as having an essential part to fill in the development of the body and in the general physiology of the organs. Exercises have been carefully investigated with reference to these effects. Gymnastics, through the study of these questions, have undergone, notably under the influence of the Swedish school, a splendid evolution with the result that their methods from this (hygienic) standpoint are almost definitely established. The direct influence of movement upon the evolution of the brain and upon the formation of the mind, not having been made evident until recently, the science of physical education has not yet paid much attention to it. Hence the absolute insufficiency of its methods.

All teachers have recognized that the systematic education of the organs of sense—eye, ear—is of great importance. The spontaneous activity of these organs determine, it is true, their evolution; but a systematic training is indispensable to make them acquire all of their psychical value. This truth has not yet been applied to muscle. When one exercises a muscle, the intention is to develop and strengthen it: the purpose is not to train by this movement the corresponding cerebral center and to act thus upon the psychical activity.

The point, however, is to force this new character upon the science of education which must then, in its instruction, consider

unceasingly the two-fold aim to be attained, and to combine the two methods to be employed.

Movement, considered essentially from the psychical standpoint, has two qualities: precision and rhythm.

Precision is the result of an absolutely exact action of the nervous centers causing the contraction of the single or only muscles taking part in the movement and the discharge of just the quantity of energy intended. It is demonstrated that in the Rolandic centers, the localization is at first very coarse or indefinite, and it is secondarily as a result of exercise that the various separate centers establish themselves. Exercise should tend to put into play muscular groups smaller and smaller, in order to help thus in that progressive functional localization the psychological benefits of which are considerable. To this end physical education will have recourse to more and more specialized muscular exercises and to fine movements: notably in a scientific instruction in manual exercises will it find opportunity to apply the pedagogical essentials.

Muscular rhythm results from the precise control of a movement, most often with another movement performed after the first. It is the expression of a rule resulting from the perfect functional synergie or correlation of the different centers of the Rolandic region. It is the external expression of the association of the various Rolandic centers among themselves and of the regular dependence established between the many sensory-motor centers of the cortex.

The manual exercises are one of the most important means which the educator may use to give to the child the idea of rhythm. Rhythmical gymnastics give equally excellent results from this point of view.

CONCLUSIONS.

Physical education, broadly understood and taught, has a powerful effect:

(*a*) Upon the health: the normal development of the organs and the regular physiological action of the different functions depend, in effect, in great part upon the putting into action of the muscular system.

(*b*) Upon the psychical development: under the influence of movement the fundamental senses (muscular sense, sense of touch) undergo a regular evolution, and the cortical layer of the brain receives directly and indirectly in its different areas the essential stimuli upon which depend the formation of the centers and their normal activity.

(*c*) Upon the development of the will and the attention: these two psychic faculties are the highest indirect expression of the work of the sensory-motor centers, and particularly of the centers of muscular sensation.

SOME DAILY VARIATIONS IN THE HEIGHT, WEIGHT AND STRENGTH.

T. A. STOREY,

Stanford University.

It is a common experience with those interested in Physical Measurement to find generally an indefinite idea or a complete lack of knowledge concerning daily changes in height, weight and strength. Students measured in our gymnasia are, as a rule, too much impressed with a gain or a loss of a few millimeters in height or a change of a kilogram or more in weight or strength. The following observations and experiments were made in order to gain some more definite information concerning variations in these measurements.

Changes in Height.—Measurements were made immediately after rising in the morning and just before retiring at night. The stadiometer used was of the type furnished by the Narragansett Machine Company and was not changed during the course of these observations. In each case the individual measured himself and made his own record, beginning his series of observations with no definite knowledge of what results he would get. Care was taken that the heels, spinal column and head should be close against the measuring bar. The position of the chin was down and in. These precautions were taken in order to guard as much as possible against a simple variation in the normal curves of the spine and in the position of the body. The height standing and the height sitting was taken in each case. All measurements were made with the individual stripped. Seven individuals measured themselves at different times during a period of three years. In all, some seven hundred and forty records were made. These records permitted three hundred and seventy comparisons upon which could be based estimates of the daily variation in height.

In every case these measurements indicate a loss in height during the day and a gain during the night. The maximum loss recorded was 3.5 centimeters. Several records give a loss of 2.5 centimeters and occurred with different indivduals. The minimum loss recorded was 4 millimeters and happened with three individuals. The average loss in height, standing, was 1.452 centimeters. In sitting height the average loss was 1.342 centimeters, indicating an average loss of 1.1 millimeters to be accounted for in the region of the legs. In only sixty-two cases

was there no evidence of a loss in the region of the legs. The maximum loss recorded in the legs was 1.2 centimeters. The same individual recorded a loss of 9 millimeters at another time. Five records of 8 millimeter losses were made by other individuals.

It is needless to say that the item of personal error in the taking of these measurements renders them all more or less inaccurate. The maximum and minimum records are untrustworthy for that reason. The averages certainly must have a definite general value.

The above results would lead one to conclude that the average daily variation in height is considerable in amount, averaging perhaps 1.452 centimeters, and that the greater part of this variation occurs in the spinal column. A slight amount of variation may occur in the joints of the hip, knee and ankle.

Changes in Weight.—In these observations two sets of records were taken. The first was concerned with the comparison of morning weight and night weight; the second, with the influence of different types of exercise upon weight. In every case the individual was weighed stripped. The records were made in pounds because the scales in use gave a finer difference in pounds than in kilograms.

In the first set of records the individual weighed himself just before retiring at night and immediately after rising in the morning. Note was made of any excretion other than that through the skin and lungs. Four individuals were weighed and four hundred and twenty-two records were made. In every comparison of morning with evening weight there was a record of loss during the night, varying between one-half pound and one pound and six-tenths. The average loss was nine-tenth of a pound. Comparing records made on different days, differences of two or three pounds were common. Longer intervals in some cases showed greater changes in weight.

In the second set of records, individuals were weighed immediately before and after different exercises.

Influence of an hour's work in the gymnasium. The time was spent in drill and apparatus work. One hundred and twenty-six comparisons of weight, made before and after forty minutes of ordinary gymnasium work, showed losses varying between three-tenths of a pound and one and nine-tenths pounds.

Influence of hand-ball contest. Records were made of the players' weights before and after seven different games. These games lasted from twenty to forty minutes. The greatest amount of weight lost occurred in the shortest game. The losses varied between six-tenths of a pound and three and eight-tenths pounds.

Influence of a two-mile run. This event was a cross-country

run undertaken by thirty-four students in ordinary gymnasium training. The losses varied between one-tenth of a pound and two and one-tenth pounds. The time consumed between weighings was between thirteen and seventeen minutes.

Influence of tennis contest. Two contestants were weighed before and after a set lasting an hour. One lost one and eight-tenths pounds, the other two pounds.

Influence of the hundred-yard dash. Two heats in the hundred lost three-tenths of a pound for the runner and one heat in the two-twenty lost the same amount.

Results. The above results indicate that different individuals react differently to the same kind of work and that the amount of loss is in proportion to the severity of the work done; also that the weight of the same individual varies from day to day.

Temperature and the amount of clothing worn must have a determining influence upon the amount of weight lost. No study was made of these influences.

Changes in Strength.—Records of these changes were gained from dynamometer and ergographic tests. The muscles of the chest and of the right and left fore-arm were used in the dynamometer tests. The deep flexors of the middle fingers of the right and left hands furnished the ergographic tests.*

Several thousand strength tests were made for another purpose. These records were obtained from some three hundred different students before and after their regular hour's work in the gymnasium. In scarcely 10% of these tests was there no change in the records made. There was usually a gain or a loss in strength during the hour.

Where the record of a single individual, made from day to day, is examined, some very noticeable variations may be found. Below are some strength records of three students, all athletes of excellent physique.

	Jan. 30	Feb. 1	Feb. 2	Variations.	
A	35 kg.	52 kg.	50 kg.	17 kg.	2 kg.
B	55 kg.	48 kg.	50 kg.	7 kg.	2 kg.
C	82 kg.	72 kg.	87 kg.	10 kg.	15 kg.

Variations like the above may be seen in any one of these series of records, though the amount of variation is different with different individuals. The point to be brought out is that the same individual will make different records at different times on the same day, and that his record will vary much from one day to another.

* The flexor sublimis has but a slight influence upon the records taken with the type of ergograph used in these experiments.

The ergographic records were made as nearly as possible under constant mechanical conditions. The records were gained from experiments performed for various purposes. In every case there was a considerable variation in strength from day to day, and also during the same day. This is, of course, a common experience with those interested in ergographic research. These records were made after training and when soreness from the work had ceased to be present. Below are some serial records from a few individuals.

Records at different hours on the same day.

A, weight 4.3 kilograms.

8 A. M.	10 A. M.	12 M.	2 P. M.	4 P. M.	6 P. M.
.816 kgm.	.975 kgm.	.748 kgm.	1.02 kgm.	1.12 kgm.	1.05 kgm.

B, weight 4 kilograms. Height in centimeters.

10 A.M.	11 A. M.	1 P. M.
206 cm.	134.3 cm.	191.5 cm.

C, weight 2.5 kilograms.

7 A. M.	8 A. M.	12 M.	1 P. M.	7 P. M.	8 P. M.	9 P. M.
334 cm.	414 cm.	400 cm.	478 cm.	436 cm.	466 cm.	502 cm.

10 P. M.	11 P. M.
412 cm.	392 cm.

Records made on different days.

March	25	26	27	28	29	30
A.	287 cm.	314 cm.	340 cm.	355 cm.		
B.	638 cm.	618 cm.	645 cm.	614 cm.		
C.	645 cm.	807 cm.	614 cm.	944 cm.	760 cm.	625 cm.

The results of these ergographic experiments indicate that the ability to do work varies a great deal during a single day and also that it varies much from one day to another.

*Summary of Results.**—There is during the day a normal average loss in height of about 1.452 centimeters. In individual cases this loss may be considerably more or less than the average here given. The greater part of the loss occurs in the region of the spinal column. The average loss found here is 1.342 centimeters. There appears to be a loss of 1.1 millimeters in the region below the trunk. The height lost during the day is more or less completely regained during the night.

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* For a comparison of results see article on "Some Investigations Regarding Loss in Weight and Gain in Height during Sleep," by F. H. Curtiss, in the Review for December, 1898.

There is a normal loss in weight each night. In the records here presented the average loss was nine-tenths of a pound. The normal daily activities increase the loss in weight. The greater the activity the greater the loss.

There is a considerable variation each day in ability to make efforts of great strength. This ability varies from one day to another and the variation amounts to a considerable number of kilograms in the strength tests.

In the light of the above results one is justified in stating that ordinary changes in height, weight and strength very often signify nothing more than a normal daily change. One may vary a half inch or more in height, he may lose several pounds in weight, or his strength tests may alter by 10 or 15 kilograms, and still be within the limits of the normal daily variation.

THE PSYCHOLOGICAL ASPECTS OF PHYSICAL EDUCATION.

DR. E. W. SCRIPTURE,

Psychological Laboratory, Yale University.

(*An abstract.*)

Physical education consists of a number of disciplines that have naturally grouped themselves together, such as gymnasium work, outdoor exercise, and various sports and games.

There has, I believe, been no fundamental thought or principle which has been used to develop a system of physical training. At least, this is the way in which all sciences, literature, and other disciplines grow up; there is an agglomeration of ideas and methods which have arisen historically. Only later does the fundamental idea of a scientific arrangement arise. This idea is developed to fit the existing circumstances, but it is often looked upon as the originating idea and as the basis of the whole discipline. This is not the case; the idea is adjusted to fit the facts, and is later than they are. Physical training is probably no exception to the rule. Having the facts of physical training before us, let us try to develop the idea on which they should be based. You probably have your own notions on the subject, and it would be needless for me to attempt to state them. As a novelty, however, I am going to state what my notion is.

Under the term "physical education" I will group together gymnasium exercises (except those designed to correct bodily defects), the various sports like rowing and football, and the exercises like military drill. The object of all education, mental as well as physical, is to improve the subject educated, to render his activity in the world more profitable to the community and to himself. Physical education is a group of disciplines that do this mainly by muscular activity. Let us first consider what happens in muscular training.

A muscle is a contractile body whose contractions are, in physical training, aroused by impulses descending along a nerve fiber from nerve cells in the central nervous system. The power of the contraction of the muscle, the condition of nourishment, and in general its activity, depend to a large degree on the activity of this center. All our activities involve contractions of more than one muscle. The large number of muscles involved in nearly every act must perform their

contractions according to a definitely and carefully arranged adjustment. This adjustment is exclusively the work of the nerve centers and their connections. All voluntary activity is known to the subject on the side of consciousness as an expression of will. Even unconscious action, in my opinion, expresses will, whereby I would define will as energy of the organism in affecting the environment. Weaker activities occur with less consciousness, and with less will. Stronger activities represent more will. Simple activities occur with less consciousness—that is, with less will—while complicated activities involve more consciousness or more will. New activities require more consciousness, or will, while habitual or automatic activities involve less mental energy. Finally, the will of the subject for any particular act may be strengthened. Thus, physical training is a simultaneous training of muscle, nerve center, and mind. I will give you some illustrations of physical training and its effects.

First, training in power. (An experiment was performed in tapping on a telepgraph key. It showed how rapidity could be increased by extra effort, by competition, by excitement.) All these increases are mental. Increase by practice is probably also partly mental. Now, what happens in muscular training? In the first place,, the muscle may be put into better condition; it may become better nourished and stronger. In the next place, the nerve center governing the muscle may be improved in its activity; it may be made more powerful. Again, the group of muscles employed will become better adjusted and co-ordinated; that is, the nerve centers will be taught to work together better, probably, by the employment of higher centers.

Second, training in adjustment. Increase in power of pressing a dynamometer is partly due, in practise, to a better adjustment of muscles: this increase is nervous. Likewise in tapping. (Experiment in marching, dumb bell practise, and other rhythmic movements were illustrated and discussed.)

Third, training in rapidity. (Experiments in reaction time were performed so as to show the mental elements involved.)

Final point, consideration of the principle of training by radiation of the effects of practise. (Experiments on "cross-education" were discussed in their bearings on the development of will.)

PRESIDENTIAL ADDRESS, BOSTON PHYSICAL EDUCATION SOCIETY.*

ROBERT W. LOVETT, M.D.

Boston.

After three years of service as your president, I do not feel like taking leave of the office without saying a few words, words of appreciation and of anticipation. Anticipation, because such societies as this, and this society in particular, seem to me to have so large a prospect in the future that it is worth while for a moment to see in what direction that development will take place.

The society is young, and it seems to me remarkably well amalgamated and organized for so young a body. My chief efforts have been directed toward giving the society a specific aim, bringing the various interests into touch, putting it on a proper financial basis, and stimulating the spirit of scientific work. In some of these aims I have succeeded, in others I have failed; but whatever failure I have met has not been for lack of your coöperation.

The movement to which I personally attribute the greatest importance is that of dividing the society into sections. The difficulty in having nothing but general meetings lay in the fact that unless the subject chosen were an extremely popular one, it failed to interest more than a certain section of members. It was impossible to find a sufficient number of subjects of general interest. Again, in this state of affairs, the work of the society was done by a very few persons, and the majority came to the meetings simply as they would go to lectures and did nothing to further the interests of the organization or to contribute to its welfare.

The establishment of sections on Medical Gymnastics, Public School Work, Normal Schools and Gymnasiums, and Anthropometry seems to me to have accomplished much. It has brought together those members whose interest is in the same topics; it has increased manifold the amount of work done by the society; it has brought into activity persons who, under the former conditions, would not have been contributors; and it has made possible the pursuit of original investigations and good scientific work. The general society is no longer a place where lectures of more or

* Delivered before the Boston Society for the Advancement of Physical Education, December 12, 1901.

less interest may be heard, but it is the meeting place of a body of workers in special sections who meet to present the work of their own sections, to listen to the work of other sections, or to listen to topics of more or less general interest. The responsibility for the work of each section is divided among its members, and persons who would not think of speaking in a general meeting become valuable contributors in the smaller sectional meetings; and thus the activity and the mutual responsibility become more widespread, and the society is the gainer.

It is in the development of the sectional work that I believe the best future opens before the society. No society that is not a contributor to the public welfare is at its best, and the avenues to contributing scientific work lie in the work of sections. A section that in a year of special meetings has failed to accumulate something of value to present to the general society, has failed in its purpose. With each section steadily at work, preferably on some line of special investigation, the yearly contributions must increase steadily in value, placing the society steadily on a higher and higher plane. With only eight meetings for the general society each year, with three or four sectional meetings and one business meeting, there remain only four or five meetings for the discussion of topics of general interest,—all, I believe, that can be provided with benefit.

The society has a responsibility: it stands as the representative of physical training before the public. Physical training is a young profession, a somewhat divided profession, one not wholly understood nor appreciated by the public. It depends on such societies as this to make the public appreciate what physical education has to offer to it. The public is indifferent and ill-informed as to the aims of physical training. The middle class is not wholly awake to the value of proper school hygiene, school gymnastics, and the like. It remains for you to set before them and to keep before them the facts about the present condition of school houses, the importance of fresh air, proper seating, and bodily exercise. The medical profession is inclined to do its part, but its members know comparatively little of the defects which to many of you are matters of daily experience.

But not only in the question of public school welfare does your responsibility lie. The foundation of the best education for physical trainers lies with such societies. A profession is no better than its schools, and they in a measure set the standard of its value. If one starts to develop a profession, one starts with the schools. Here you have the opportunity to discuss and formulate the best normal school training, and if that is proоerly done each school must adopt it or fall behind.

Again, in medical gymnastics nothing can do more to free

the profession from many of the half-educated and unscrupulous practitioners who use the name and bring discredit upon it, than to have the subject brought prominently forward in the proper scientific spirit in the section and in the society. Such a subject as medical gymnastics gains in force by every scientific discussion in such a society as this.

I have mentioned only three of the many subjects that seem to me to stand near at hand, to demand proper scientific investigation and exposition, and which are not likely to receive wide attention except in such societies as this. The public needs and wants what you have to offer, but the public is not in proper touch with you. This touch is not, I think, to be brought about by enticing the public to come to popular lectures in this hall, but by steadily working on in the line of scientific investigation and thus educating the public to understand what this society can do for it.

The tremendous pressure of American life, the rush, the tension, the steadily increasing demands of life, are pauperizing the community in a physical way. They are needing each year the things which physical education can give. You have only to bide your time to find the public looking to you for advice and assistance. But to be in that position, such societies as this must work, and work steadily. It is not to be done by listening to interesting lectures, but by investigation, which means hard work; by the preparation of papers, which is harder to many; and by stimulating discussions in the sections. The position to which your responsibility entitles you will not come of itself, but only by dint of hard and steady work. I put it not so much on the ground of your option as of your plain responsibility and duty.

REPORTS FROM SOCIETIES.

Southern Michigan Physical Education Society.

At the fall meeting of the Southern Michigan Physical Education Society, which was held in Ann Arbor, in adition to the reports of the standing committees, papers were given as follows: W. P. Bowen, Ann Arbor, "The Question of National Physique"; Miss Bertha Stewart, Ann Arbor, "The Chautauqua Summer School"; Mrs. Fannie Cheever Burton, Ypsilanti, "Harvard Summer School"; and Dr. Alice G. Snyder, Ann Arbor, "Physical Training in Germany".

Following this program, illustrative practical work was given in the Barbour gymnasium. This consisted of parallel bar work under the direction of Dr. May of the University of Michigan, and a class in Swedish Gymnastics directed by Mrs. Burton of the Michigan State Normal College. Two games of basketball were played,—one by the U. of M. girls, umpired by Dr. Alice G. Snyder; the other by Normal College girls, umpired by Mrs. Burton. These were to illustrate the game as played by different rules.

At the close of the meeting, which was the most successful one since the organization of the society, the following officers were elected: President, W. P. Bowen, Ann Arbor; 1st Vice-President, Dr. Alice G. Snyder, Ann Arbor; 2nd Vice-President, Mr. M. B. Seiffert, Detroit; Secretary, Mrs. Fannie Cheever Burton, Ypsilanti; Treasurer, Miss Florence Carne, Detroit.

The society has a membership of twenty, and holds two meetings annually, one in Ann Arbor and one in Detroit. In addition to the meetings, the interests of the work are to be furthered this year by a paper on Physical Training at the convention of the general State Teachers' Association which convenes in Grand Rapids in December.

Fannie Cheever Burton, Secretary.

Philadelphia Physical Education Society.

The first of the series of meetings of the Philadelphia branch of the A. A. A. P. E. for the season 1901-1902 was held on October 19, 1901, at the Aldine Hotel. A luncheon was served which, because of the opportunity furnished for social intercourse

and to become better acquainted with one's co-workers, was a most pleasant feature of the meeting. President Sharpless, of Haverford College, was the guest of the society.

After a short business meeting, President Sharpless was introduced as the speaker of the afternoon. As Dr. Sharpless is Professor of Ethics at Haverford, his presentation of "The Moral Side of Physical Training" was naturally of great interest and value.

Dr. Ehinger's paper on "Deformities Produced and Corrected by Gymnastic Exercises" was full of suggestions for further study and research.

Dr. Cummings, of Swarthmore College, gave a short talk on "Intercollegiate Strength Tests: The Way These Tests are taken and Their Value."

Miss Thomas, of Westtown; Miss Adams, of Friends' Select School; and Mrs. Ehinger, of West Chester Normal School, gave five-minute talks on the Anthropometric methods used in their respective schools.

LOUISA SMITH, Secretary pro tem.

BOSTON PHYSICAL EDUCATION SOCIETY.

The Boston Physical Education Society, since the last report, has held its regular monthly meetings at which a number of very interesting papers have been presented, these papers being followed usually by general discussions of a helpful nature. Briefly stated the report is as follows:

February—Dr. E. A. Darling read a paper on "The Physical Effects of Training for Athletic Contests." Dr. McCurdy read a paper on "Blood Pressure."

March—Dr. Mulliner, Chairman, reported for the nominating committee the names of delegates to the New York convention. Dr. Sargent read the new constitution proposed by the Council of the A. A. A. P. E.

April—Dr. Brackett read a paper on "Chronic Irritability of the Spine due to Faulty Attitudes," illustrating with stereopticon.

May—The Section of Medical Gymnastics had charge of this meeting. Miss Webber, Secretary, read a report of the proceedings of the section. Subject: Hydrotherapy. Speakers: Dr. Putnam, Dr. Briggs.

June—Mr. Jacob A. Riis, of New York, spoke on "Playgrounds and Their Place in Physical Education." Mr. Chas. E. Stratton, Chairman of the Park Commission, spoke of what has been done

in Boston by the Board of Aldermen and Common Council to provide playgrounds. Mr. Joseph Lee referred to the present facilities in Boston for playing.

October—Mr. Edwin P. Seaver spoke on "Manual Training in the Boston Public Schools."

November—This meeting being the last before the annual meeting, the Chair appointed the nominating committee to report the officers for the ensuing year.

The section on Normal Schools had charge of this meeting. Miss Bennett gave a brief account of what the section was doing. Dr. McCurdy spoke on "The Advance of Gymnastics in the Preparatory Schools and Colleges." Baroness Posse gave a report of the origin and growth of the Posse Gymnasium. A report of the Boston Normal School of Gymnastics was given. Dr. Sargent gave a report of his school. Dr. McCurdy gave an account of physical training in the Y. M. C. A. Training School at Springfield. Dr. Savage, of Columbia University, New York, and Delphine Hanna, of Oberlin College, Ohio, sent letters to be read.

SARAH SOUTHWORTH WEBBER, Secretary.

NEW HAVEN PHYSICAL EDUCATION SOCIETY.

A meeting of the New Haven Physical Education Society was held on Thursday evening, November 21, 1901, at the new Yale University Psychological Laboratory. There were about fifty persons present.

Dr. Wm. G. Anderson, Associate Director of the Yale Gymnasium, gave an illustrated talk entitled "Physical Training Abroad." About eighty slides were shown, graphically picturing the English and Swedish methods of gymanstics, athletics, and outdoor sports.

A business meeting was held immediately after the lecture at which eleven names were proposed for membership.

Dr. Jay W. Seaver made a motion, which was carried, that the Chair appoint four committees of two each to report at each monthly meeting upon the following subjects: (1) New Gymnasium Literature, (2) Athletics (new games, etc.), (3) Anthropometry (new instruments, experiments, etc.), and (4) Normal Schools.

Dr. Seaver further moved, and the motion was carried, that the Chair appoint a committee consisting of three of the older members of the society to devise means and raise funds to defray the expense of securing speakers from other cities.

CARRIE L. GRUMMAN, Secretary.

REPORTS OF THE COUNCIL.

June, 1901—Present: Drs. Savage, Gulick, and Wallin, and Miss MacMartin.

Upon discussion it was decided to separate the Secretaryship and the Editorship of the REVIEW.

The following officers were elected: Dr. Savage, President; Miss Bancroft, Secretary; Miss MacMartin, Treasurer; Dr. Gulick, Editor of the REVIEW.

LUTHER GULICK, Secretary of the meeting.

September 23—Present: Drs. Savage, Wallin, Gulick, and Taylor, Mr. Haug, and Miss Bancroft.

The minutes of the previous meeting were read and approved.

The President read the positive resignation of Mr. J. Blake Hillyer from the Council. Dr. Gulick moved that this be accepted with keen regret, and that the Secretary be instructed to extend to Mr. Hillyer a vote of thanks for his exceedingly efficient work on the Convention Committee. The motion was unanimously passed.

The following additional members of the Council were elected: Mr. Jakob Bolin and Miss Josephine Beiderhase.

Upon discussion it was decided to consolidate the offices of Corresponding and Recording Secretary.

Miss Jessie H. Bancroft withdrew her resignation of the Secretaryship and was elected to that office; Dr Henry Ling Taylor, First Vice-President, and Dr. Matilda K. Wallin, Second Vice-President.

The following Committee on Finance was elected: Dr. Savage, Chairman; Miss MacMartin, Mr. Haug.

The proposition to invite associate editors upon the REVIEW was discussed, and upon motion of Dr. Taylor was referred with power to the President, the Editor of the REVIEW, and the Secretary.

The Secretary was instructed to communicate with the former Secretary and ask to have the business papers of the Association sent to an address to be determined upon by Dr. Gulick and Miss Bancroft.

The following resolution was offered by Dr. Gulick, seconded by Dr. Taylor, unanimously passed, and ordered spread upon the minutes:

Whereas, under the direction of Dr. George W. Fitz the REVIEW has maintained high standards, and has proved an inspiration and a practical help to physical educators; and

Whereas, in our judgment, it has been an important factor in the growth and success of our Association, therefore be it

Resolved, that we record our hearty appreciation of the valuable work done by Dr. George W. Fitz as Editor of the PHYSICAL EDUCATION REVIEW.

Upon motion of Dr. Taylor the Council adjourned to meet subject to the call of the Chair.

JESSIE H. BANCROFT, Secretary.

October 21—Present: Drs. Savage and Gulick, Messrs. Bolin and Haug, and Miss Bancroft.

The minutes of the previous meeting were read and approved.

The following were elected members of the A. A. A. P. E.: Allerton, Mary G.; Aldinger, H. E.; Blatchley, Charlotte; Bowyer, Maude A.; Besket, C. E.; Britt, Jessie E.; Berry, Laura deR.; Cober, E. W.; Clark, Clara; Callahan, Mary M.; Colburn, Lilla B.; Davis, Helen Alling; Diall, Thomas S.; Dolan, Nellie; Douthitt, C. M.; Dunham, Edith Riteman; Dutton, Hope; Ford, J .S.; Harvey, Elma L.; Johnson, Iris Leighton; Kite, Anna S.; Lang, C. G.; Leland, Arthur; McLeod, Mary L.; Massman, R. C.; Morison, Mary F.; Moses, Charles; Osborne, Alice; Pearse, Alice W.; Pearson, Henry F.; Parker, Mary E.; Printz, B. G.; Pyle, Aline; Rogers, Margaret Fuller; Russell, Leon; Sawyer, Edith; Shaw, Sarah; Spore, Nellie Amelia; Smith, Sadie E.; Shepardson, Grace; Stilwell, W. A.; Talbot, Dr. W. T.; Wilde, Harriet; Wittig, R. L.; White, John G.; Worther, Carrie; Thomas, W. Scott; Blake, C. A.; Elliott, Lillian; Fetzer, Katherine; Goodhue, Jos. A.

The Secretary was instructed to notify local societies of new members in their vicinity.

The Council voted to hold its meetings monthly on the first Saturday evening, except during July, August, and September, at 8.15, the first regular meeting to be in December.

A report was called for and made of the papers on hand from the Convention program.

There was a discussion as to whether or not all papers presented to the Convention should be published in the REVIEW. It was decided to publish all.

Upon discussion it was decided to publish the Convention material in two numbers of the REVIEW, the June and September numbers.

A circular in manuscript announcing the new Council and Editorial Staff was read. It was decided that this circular be printed and sent to all members, subscribers and exchanges. The Secretary was so instructed.

The Secretary was instructed to send bills to the delinquent members with the above circular.

The Secretary was instructed to draw upon Treasurer Eberhard for $150.00 voted for the Convention by the National Council of the A. A. A. P. E.

The Secretary was empowered to use this amount, or parts of it, for current expenses, and to turn over the balance to the Treasurer upon her return from Europe.

The Secretary and Treasurer were constituted a committe to attend to the printing of stationery, blanks, etc.

The Council voted that the advertising for the REVIEW be left to the Finance Committee, to be reported upon at the next meeting; and that if it be necessary to make a contract with any advertising agency, such contract be submitted to the Council.

The meeting then adjourned.

JESSIE H. BANCROFT, Secretary.

November 9—Present: Drs. Savage, Taylor, and Gulick, Messrs. Bolin and Haug, Miss Beiderhase and Miss Bancroft.

The minutes of the previous meeting were read and approved.

Dr. Gulick moved that the Editor of the REVIEW be instructed to proceed, on the first of December, with the publication of the REVIEW with matter then in hand. Passed.

Dr. Gulick moved that the Secretary be instructed to prepare an order of business for Council meetings and to present this at the next meeting. Passed.

The following were elected to membership in the Association: Fleming, Katherine M.; King, Mrs. Bessie M.; Palmer, Cora Ellen; Phillips, Mary R.; Zoller, Emma Louise.

The following resignations were accepted: Margaret D. Fisher, Brooklyn, N. Y.; Caroline Bolton, Roslindale, Mass.; Annie M. Cutler, Waltham, Mass.; Kate L. Adams, Brookline, Mass.

Mr. Bolin moved that the Pittsburg Physical Education Society be accepted as a branch of the A. A. A. P. E., and that the Secretary be instructed to correspond with the proper officers of that society as to the exact title by which it should be known, and to decide upon such title with said officers. Passed.

The following resolution presented by Dr. Taylor was unanimously passed:

Whereas, many members of the National Organization are not members of the local societies, and vice versa; and

Whereas, this condition is deemed detrimental to the best interests of the Association as a whole; therefore, be it

Resolved, that the Secretary be requested to prepare and submit to the President an analysis of the membership of the Association with reference to the distribution as to sections and districts; and

Resolved, that the President be requested to prepare a statement for publication in the REVIEW calling for an expression of opinion upon a proposed change of policy authorized by the Council; and

Resolved, that the same be published in the forthcoming issue of the REVIEW.

On motion the Council adjourned.

JESSIE H. BANCROFT, Secretary.

December 7—Present: Drs. Savage, Taylor, Wallin, and Gulick, Miss MacMartin, Miss Beiderhase, Miss Bancroft, and Mr. Bolin.

The minutes of the previous meeting were read and approved.

The following order of business was adopted:

Minutes of the preceding meeting.
Election of new members.
Action upon resignations.
Report of Secretary, including correspondence.
Report of Treasurer.
Report of Editor of the REVIEW.
Report of committees, in alphabetical order.
Unfinished business.
New business.

The following members were elected: Bergron, T.; Carter, Clara V.; Evans, Nettie Anne; Hayes, M. D.; Heywood, C. E. A.; Kells, Blanche; Knapp, H. B.; Orton, Albert; Pearson, W. R.

The resignation of Dr. John F. Bottomly was accepted.

The Secretary's report was received.

Mr. Bolin moved that arrangements with the Post Office Department for the mailing of the next number of the REVIEW be left to the Secretary, and that she report at the next meeting. Passed.

The Treasurer's report was received, and showed $114.00 on hand exclusive of funds in the hands of the Secretary.

The Finance Committee reported progress in the securing of advertisements for the REVIEW.

The Editor of the REVIEW reported progress.

The formation of a Committee on Measurements and Statistics was referred to the President with power.

Upon motion it was decided that the next meeting of the Council should be held on the second Saturday in January.

On motion the Council adjourned.

JESSIE H. BANCROFT, Secretary.

EDITORIAL NOTE AND COMMENT.

The March and June numbers of the REVIEW will be issued during the summer, and it is hoped that with them all delays and disappointments in connection with the publication of the magazine will be ended.

WANTED.—Addresses of the following members of the A. A. A. P. E.:

Miss Julia Culver,
Miss Mabel Mearns,
Carl Dautrich,
Charles Jenney,
Prof. Wane Eugania Morgan.

Send to JESSIE H. BANCROFT, Secretary, 80 Joralemon St., Brooklyn, N. Y.

WANTED.—Back numbers and Annual Reports as follows:

AMERICAN PHYSICAL EDUCATION REVIEW, March and June numbers of Volume II, 1897.

Annual Reports of the A. A. A. P. E. for 1885, 1886, 1888, 1890.

Any one having these publications will confer a favor by communicating with the Secretary, Miss JESSIE H. BANCROFT, 80 Joralemon St., Brooklyn, N. Y.

ABSTRACTS.

Physical Training as a Profession.—A suggestive and graphic paper appeared in the Association Seminar for March on Physical Training as a Profession. It came from the pen of a man well equipped for pointing out the needs of the people and the means for supplying these demands, as he has been a teacher of gymnastics in association work and also in a Normal School that is preparing men for the profession of which he writes.

That there has been a marked diminution in the amount of muscular work expended in all lines of production during recent years is clearly shown by all statistics of labor and manufactures. That this lessening of labor in production is not a relief to humanity is not clear. Aside from the primitive theological view of manual toil, there are social and physiological reasons for considering it an obstacle to racial progress. Just as the invention of clothing enabled our progenitors to expend more energy in productive employments and thus progress toward civilization, so the invention of labor-saving devices in our own day should set us free for broader activities and enable us to live better. We must trace the neurose of to-day to abnormal and even criminal methods of life that are the outgrowth of inordinate ambition, the easy acquisition of wealth, and the high standard of nerve activity in modern life. Our mental standards are unhealthy, our processes are bad, and our product is necessarily poor and defective. It seems to be agreed by those versed in anthropometry that the modern physical type is better than the ancient, and the average age is certainly greater although the tendency to succumb to nervous disorders is decidedly increased. The fault then must lie in the line of mis-directed nerve training and working. This is undoubtedly what one reads between the lines in the first part of Dr. McCurdy's article.

The next portion is devoted to a graphic statement of the growth of physical training in this country and it presents a number of most helpful synoptic summaries. It appears that in colleges the number of gymnasia increased three-fold in the period from 1870 to 1885, and seven fold from 1885 to 1900, and that preparatory schools and Y. M. C. A.'s exhibited a correspondingly increased attention to the subject. Yet it appears from these statistics, and other gathered by Mr. Affleck, now of the State Normal School, Cedar Falls, Iowa, that only twenty per cent. of these gymnasia are directed by instructors with technical

training; and yet we wish to have our work considered professional—namely, such as requires definite mental training in the history, theory, and method of the science.

As physical educators we may not be proud of the fact that our work has so loose a relation to actual science as to permit laymen to seriously compete with us. It has been claimed that medicine is not a science, and yet if it had established no better claims than has physical training we should probably have four-fifths of the medical practice in the hands of the laity. This may suggest to some of us, who are somewhat mature in the work, that our attitude and information, as well as instruction, has not been of such a high grade as to establish in the popular mind the importance of our work. A third portion of this paper is devoted to an interesting estimate of the extent of the field that may be occupied by the members of this quasi-profession. It appears that there are 747 directors of gymnasia while there are 1,084 gymnasia with equipment, and there are estimated to be 3,611 institutions that should have departments of physical training established. At the rate at which the field has been occupied during the last fifteen years it is estimated that there will be a demand for 149 new teachers each year, and that to supply this demand there should be at least 450 people in the normal training schools of the country. If the same percentage of untrained men are to occupy positions, it will still leave openings for 50 new teachers each year; and this refers only to such positions as may properly be expected to be filled only by men. The growth of the work for women has been much more rapid and has demanded a much larger output of material from the normal schools. The magnitude of the work, therefore, if not the high standard in quality, is a matter of great encouragement.

The last part of the paper refers to the kind of man who should enter upon this line of work. "Two sorts of men are needed: First, men with necessary technical skill who have the executive ability to put their knowledge into practice; second, men of scientific ability who will increase our knowledge with reference especially to bodily growth, to personal hygiene, to physiology of exercise, etc." The requirements as to temperament, character, etc., are beyond criticism, but the outline of training needed is too general to be helpful to the student or clear as to the total results that will be obtained by following it. It would have been extremely interesting if the question of salaries had been studied and discussed with as much frankness and with as many satisfactory results as are found in the other topics to which reference has been made.

J. W. S.

Vulnerability of the Apices in Tuberculosis of the Lungs.—Colbeck and Pritchard (*The Lancet,* June 8, 1901) call in question the widely accepted view that the greater vulnerability of the apical lobes of the lung to tuberculosis is the result of the greater rigidity of the upper region of the thorax. They point out that this explanation does not "account for the singularly constant localization of the lesions at a point which is situated, roughly, from one to one-and-a-half inches below the summit of the lung." And the same objection applies with equal force to other previous explanations.

The paper then goes on to show that "the apices of the lung, unlike the rest of the pulmonic tissue, are not contained within the thorax, but project dome-like from three-quarters of an inch to one-and-a-half inches above the border of the first rib. The coverings of the apices consist, therefore, not of the firm wall of the chest, but of fascia, muscle, and skin, which, under the most favorable conditions, can offer, comparatively speaking, but an imperfect support to the lung at the outlet of the thorax." (The term "thorax" is somewhat unfortunately used by the writers to mean the costal framework of the thorax; "outlet of the thorax" is similarly unfortunate.) Consequently, with the increasing negativity of pleural pressure during inspiration, this supra-costal portion of the thoracic wall will be sucked inward, and the movements of the lung "*inverted* as regards their relation to the normal respiratory rhythm." Indeed, even in perfectly healthy individuals it is found that "with increasingly deep inspirations, the inflation of the apices becomes relatively lessened, as is shown by the rise in pitch in the percussion note obtained in the supra-clavicular fossæ"; and if, owing to insufficient muscular development, or to the forward displacement of the shoulders, the loss of support from this portion of the thoracic wall goes far enough, "the time must come when the movements of the apices become inverted in their relation to the normal respiratory rhythm": thus in passing from this region of inverted to that of normal rhythm, there must be a region where the lung does not move at all. This is the vulnerable region and would be situated where the initial lesions of tuberculosis are actually observed.

The main conditions which lead to the inverted movement of the apices of the lung are given as (1) the carrying forward of the acromial ends of the clavicle, thus widening the supra-clavicular fossæ and so diminishing the support afforded to the lungs by the sternal ends of these bones, and (2) maldevelopment or wasting of the sterno-cleido-mastoid muscles, whereby their normal "'trap-door' action over the superior aperture of the thorax is largely minimized or removed." Imperfect development of the pectoralis major and the trapezius may also similarly contribute

to this result. Evidence is given that the chests of the weakly developed youth and young adult actually present these physiological as well as anatomical features, and the very important conclusion drawn that preventive measures must consist not so much in the cultivation of the upper ribs in breathing as in "pulling the chest into shape" and strengthening the muscles which exert a trap-door action during respiration. T. H.

The Value of Physical Exercise in Pulmonary Affection.—Dr. T. Clifford Ollbutt, in the *London Lancet*, November 9, 1901, warns against the insidious onset of pulmonary tuberculosis and discusses the sanitorium treatment of the disease. Among other things, he says: "The restoration of the heart degenerated by toxins is to be brought about by regulated exercise. On massage I would invite opinions. I would ask particularly whether massage is inadmissible during moderate fever. I have found much good in the wet sheet, and the wet pack may be helpful in this condition.

"The use of gymnastics in the treatment of phthisis is little understood. In healing stages, when softening has ceased and the lung is drying and laying down protective fiber, may not gymnastics, under supervision as skilled as for cardiac disease, do much to expand and thus to call into healthy function the parts which the tubercle has spared? I seek the answer from those who are dealing daily with these problems.

"Finally, I must protest against the emptiness of mind which certain reformers would enforce upon their patients. I feel sure that a lack of tranquil occupations and amusements conduces to introspection, and, moreover, is not without grave peril to the moral life. The vacuous looks and aimless wanderings of the patients hanging about the precincts of some sanatoriums have impressed me painfully. Vigorous games are rarely suitable; but surely there are occupations, such as gardening, the fine arts, literature, natural history, and quiet handicrafts, which to those free from fever would be beneficial."

M. P. E. G.

Taking Casts of Various Parts of the Body.—We have to thank Dr. George A. Peters, of Toronto University, for a report of his paper in the *British Medical Journal* of September 3, 1898, giving his original method of taking casts of the various parts of the body.

He uses paraffin kept in a molten state surrounded by a hot water jacket. This is sprayed on the part through an atomizer

driven by a motor. Another spray of cold water is used to shorten the time of cooling.

The advantages claimed over the ordinary method of taking a plaster cast are the greater accuracy and more perfect detail obtained, the lack of compression due to the weight of the plaster, and the ease with which the mould is removed from the cast by merely heating it and making it soft and pliable.

The disadvantages of his method are the trouble in carrying it out and the complicated apparatus required. These are offset by the undoubted advantages, in accuracy and delicacy, of the resulting cast.

There is no way by which an unusual or remarkable development or form of arm or leg, hand or foot, can be better recorded than by a cast of the part. It avoids the inaccuracy of photography and gives detail that neither pictures nor measurements can show with the same clearness. The possibilities of the method have been shown by the complete cast of Sandow's body recently taken with all the muscles in contraction, copies of which are in the British Museum and Harvard University.

R. T. M.

BOOK NOTICES AND BIBLIOGRAPHY.

Die Frauenkleidung von Dr. C. H. Stratz. Euke, Stuttgart, 1900. Pp. 129; 102 illustrations.

Die Kultur des weiblichen Körpers als Grundlage der Frauenkleidung. Paul Schulze-Naumburg. Diederichs, Leipzig, 1901. Pp. 152; 133 illustrations.

Costume Deformities. E. H. Bradford, M.D. *New York Medical Journal*, October 26, 1901.

Since the principles of correct clothing rest upon a proper appreciation of the structure and functions of the human body, and improper dress is a serious impediment to the work of the physical trainer, the subject is one of special interest to the readers of the PHYSICAL EDUCATION REVIEW. Physicians and artists of reputation are beginning to approach the matter in a broad and serious manner, making out of the rich historical, ethnological, artistic, and anatomico-physiological, material to establish a rational, hygienic, and æsthetic basis for clothing, especially for women.

Errors in dress rest largely on false standards of taste, standards which could not exist if some of the most elemental facts of physical structure were generally known. From a study of the masterpieces of sculpture, of the human form in civilized and savage man, and of the history of dress and of civilization, it is evident that the clothing of women, and to some extent of men, has been designed for centuries with special reference to altering the shape of the figure, or to making it appear different from what it really is. Dr. Bradford says: "Exaggerated fullness of the hip, disproportional leanness of the legs and lower thighs, the flattened chest, the narrow waist, and the long neck are costume deformities to be avoided in a healthy civilization which seeks to preserve what nature gives." "The school exhibition gymnastic drill is often distressing to the observer who notices the close-collared, waist-bound girls and their round-shouldered, flat-chested deformity only partly concealed by a hollow-back, erect attitude."

Both Dr. Stratz and Paul Schulze-Naumburg, the artist, point out the easily visible and often crippling deformities produced by conventional dress, and seek to awaken a sense of the true lines and proportions of the body, a sense which has been so sadly lacking in our age that even the artists often accept and copy de-

formity. Schultze-Naumburg also points out that the unity of the body, and especially of the trunk, is vital and fundamental, its division into parts largely artificial and arbitrary. Constriction of the soft parts above the pelvis not only limits the functional power of the trunk, but mars its artistic and structural unity. The body is, after all, more than its covering, and should determine its essential features. The active, throbbing, changing body, striving for expression and efficiency, will surely shed the false, rigid, ugly shell wherein fashion and custom seek to confine it, and will clothe itself in forms that will be suitable, graceful, and free. Let us more earnestly seek to understand and to improve the man or woman inside the clothing, and what is false and harmful in dress cannot long survive.

H. L. T.

CALISTHENIC DICTIONARY; A. L. FISH, 1902.

The need of a simple and adequate nomenclature of physical training has been keenly felt in the past few years. Those who teach German or Swedish gymnastics do not feel this need so much because fairly adequate nomenclatures exist for these systems. Unfortunately, however, the terms of these two nomenclatures are so different that familiarity with the terms of one is of very little assistance in understanding the other. Furthermore, we have several other more recent nomenclatures that have not been used so extensively. Probably the most adequate of these are the Gymnastic Nomenclature of the Young Men's Christian Association of N. A. and the Gymnastic Nomenclature arranged by Dr. W. G. Anderson. Various terms for certain movements have been introduced by teachers in England and America. Some of these terms have persisted while others have disappeared.

Several attempts have been made by individuals and committees to arrange an adequate nomenclature, but none of these have been adopted extensively, for the same reason that made Jonathan Swift's idea concerning the English language impracticable. He contended that "it is better a language should not be wholly perfect, than that it should be perpetually changing"; that, therefore, "some methods should be thought on for ascertaining and fixing our language forever, after such alterations in it as shall be thought requisite." Other men besides Swift have attempted to formulate arbitrary rules for the development of the English language, but their efforts have been in vain. In the same way no arbitrary nomenclature of gymnastics that will be adopted extensively can be arranged by an individual or committee.

The idea first suggested by Dr. C. J. Enebuske at the National Conference of the American Association for the Advancement of Physical Education, in Boston, 1900, and carried out by Mr. A. L.

Fish in his Calisthenic Dictionary just published, is undoubtedy the best means to secure the needed nomenclature. This calisthenic dictionary is in no sense another nomenclature, but simply a collection of all terms found in the various nomenclatures in use and arranged in dictionary form. As far as possible synonymous terms have been placed side by side with a foot note giving the origin of each term.

In accordance with certain rules given in the General Plan, Mr. Fish has made a selection of preferable terms and placed them in each case before the corresponding terms in the various nomenclatures. This may appear to some as an attempt to introduce a new nomenclature, but as in the case of the English language, neither Mr. Fish nor anyone else can force any teacher or teachers to adopt this or that term. The dictionary will, however, serve the purpose of making any calisthenic exercises intelligible to any teacher who will make use of it. Time only will decide which terms are best, and these will gradually supersede the others. We shall then, by a natural process of the "survival of the fittest", develop a nomenclature which will be valuable because it is natural and the result of experience.

One thing more is needed to accomplish the purpose of the dictionary. All teachers of physical training must become familiar with the various terms in the dictionary and cooperate to bring about the desired result.

The nomenclature of wands and bar bells by Dr. J. H. McCurdy is based on the rules given in the general plan of the dictionary. This general plan is clear and consistent, though necessarily complex. This nomenclature is the clearest and most complete that has been suggested for wands and bar bells.

The Indian club nomenclature by Drs. A. T. Halsted and F. N. Seerly is clear and adequate for anyone who has the patience to work it out and apply it. The greatest difficulty in the way of a general use of this nomenclature is the large amount of material which has to be committed to memory. Few teachers will probably take time to familiarize themselves with it, but for those who do, it will undoubtedly prove entirely satisfactory.

G. L. M.

CLASSIFICATION FOR PHYSICAL TRAINING, BY J. H. McCURDY, M.D., AND J. T. BOWNE. 2ND EDITION.

Anyone who has occasion, either as reader or as librarian, to use books on physical training will welcome such assistance as is offered by this classification so carefully worked out by Dr. McCurdy and Mr. Bowne. It is so arranged that it may be inserted in a Dewey system of decimal classification under the heading

"Gymnastics", or used in connection with other systems, or alone. It deals with the subject of physical training comprehensively, including not only bodily exercise and such matters as site, construction, and equipment of gymnasia and athletic fields, but the mental, spiritual, and social training of man as well.

The prime object of library classification is to enable a reader to find information on any subject as quickly and easily as possible, and to that purpose this classification seems admirably adapted. It is convenient, and full enough to meet every requirement, and should be of great use in making the literature of physical training more accessible.

A. S.

HANDBUCH DER SCHULHYGIENE.

Professor Burgerstein, without doubt the greatest authority on school hygiene in Europe, is preparing, in conjunction with Professor Netslitzky, a second edition of his famous "Handbuch der Schulhygiene." The new edition will be a great improvement on the first, containing an incomparably larger amount of material, based largely upon new and original investigations. To accomplish this end, Burgerstein has placed himself in correspondence with many specialists on the subject, and has secured numerous contributions which will appear for the first time in the new volume. Burgerstein's studies of fatigue were epoch-making, and it is due to him, largely, that the hygienic conditions under which the teacher's work is done have received as close attention as those among which the pupils are expected to work. No teacher who is at all interested in school hygiene can afford to ignore the forthcoming volume. M. P. E. G.

MONATSSCHRIFT FÜR DAS TURNWESEN, BERLIN, 1900. VOL. XIX.

No. 8 (August). Physical Exercise in the Schools and the Demands of Modern Life, by Dr. F. Hueppe.

No. 9 (September). The New Home of the Royal Normal School of Gymnastics in Munich, by G. H. Weber. Gymnastics at the Second Examination of Teachers in Elementary Schools. Remarks on Dr. Küppers's "An Ancient Jumping Track," by Dr. F. Hueppe. Review of Dr. Konrad Koch's "Education in Courage by means of Gymnastics, Games and Sport, the Spiritual Side of Physical Exercise," by Küppers. Review of Vogt and Buley's "Theoretical and Practical Manual of Gymnastics for Normal Schools", by Ludwig Glas.

No. 10 (October). The Fiftieth Anniversary of the Royal Normal School of Gymnastics in Dresden (continued in No. 11). Remarks on Dr. Hueppe's "Physical Exercise in the Schools and

the Demands of Modern Life", by A. Böttcher. A Review of Gymnastics in the XIX. Century, by Carl Euler (begun in No. 1, continued in Nos. 11 and 12). A Popular Pentathlon at the Royal Matthiasgymnasium in Breslau. A Gymnastic Festival by Elementary Schools in Thuringia.

No. 11 (November). Competitive Prisoner's Base for the Bismark Shield in Berlin in 1900. A Summer Excursion by Hanover Pupils to Upper Bavaria and the Tyrol.

No. 12 (December). The Development of School Gymnastics in Hanover since 1890, by A. Böttcher.

1901. Vol. XX. No. 1 (January). The Value and Method of Instruction in Anatomy, Physiology and Hygiene for Teachers of Gymnastics, by Dr. F. A. Schmidt (concluded in No. 2). A Group of Iron Dumb-bell Exercises for Girls and Young Women, by Aug. Hermann.

No. 2 (February). The Next Congress of German Teachers of Gymnastics, J. Ch. Kennes. Exercises from the Exhibition of the Course for Women Teachers of Gymnastics in Bonn, by Fritz Schroeder (continued in No. 3). Report of the Berlin Society of Teachers of Gymnastics for the Year 1899-1900. Bathing and Swimming by the School Children in Kassel.

No. 3 (March). The Discus in Homer's Iliad and Odyssey, by Dr. Machnig. The Work of the German Turnlehrerverein, as Exhibited in Annual Reports from Branch Societies (continued in No. 4). The City Gymnasium in Köslin, by P. Schulz. The XXV. Anniversary of the Bremen Turnlehrerverein. Annual Reports of the Breslau and Dresden Turnlehrervereine for 1900.

No. 4 (April). Investigations of Fatigue and their Application in Gymnastic Instruction, by H. Schröer (concluded in No. 5). Announcement of the Next Course for Training Teachers of Gymnastics in Berlin. Reduced Fares for Excursions by Railway. Annual Meeting of the Wurtemburg Turnlehrerverein. Teachers' Courses in Games in 1901.

No. 5 (May). Dr. Karl Wassmannsdorff, on his LXXX. Birthday, by Küppers. Good Walking, by M. Zettler. School Games Especially Useful as a Preparation for Military Service, by Dr. E. Kohlrausch (concluded in No. 6). Proceedings of the XIV. General Gathering of German Teachers of Gymnastics and the II. Congress of the German Turnlehrerverein in Magdeburg June 3-6, 1900. Review of Colozza's "Psychology and Pedagogy of Children's Play", by Dr. Küppers. A Plan of Work for Branch Societies of the German Turnlehrerverein. A Summons to Students in German Universities.

No. 6 (June). The Death of J. C. Lion, May 30th, 1901. How to Increase the Hygienic and Practical Value of Gymnastics, by Paul Selge. Bathing and Swimming in Homer's Iliad and Odys-

sey, by Dr. Machnig. Official Instructions (1901) regarding Gymnastics in Secondary Schools in Prussia. Teachers' Courses in Games at Bonn and Braunschweig. Required Instruction in Swimming at the Elementary Schools for Boys in Bautzen.

F. E. L.

DEUTSCHE TURN-ZEITUNG, LEIPSIC, 1901, VOL. XLVI.

No. 8 (February 21). Gymnastics and the Training of Teachers of Gymnastics at German Universities, by J. Heinrich (concluded in No. 9).

No. 9 (February 28). Life Memories, by Carl Euler (continued from No. 7, and in Nos. 24 and 26). A New Gymnastic Apparatus, the "Zweistütz", by Dr. Greeven. Groups of Exhibition Exercises on the Parallel Bars and Horizontal Bar, by B. Reitmaier. The Constitution of the Italian Gymnastic Federation (1900), by Gustav Retzdorff. A Brief Review of Swiss School Gymnastics in the XIX. Century. The Prevention of Accidents in Fencing, by Max Richter.

No. 10 (March 7). Graceful Carriage, by M. Zettler. A Group of Tactics and Wand Exercises, by Ed. Küffner. Boxing in Homer's Odyssey and Iliad, by Dr. Machnig. Children's Games in Zurich in the Summer of 1900, by J. Binder. The International Congress of Physical Education (Paris, 1900), by Johs. Temming.

No. 11 (March 14). The Relation of the German Turnerschaft to Conditions in its XV. District (German Austria. Our Favorite Gymnastic Apparatus (the Parallel Bars), by Dr. R. Gasch (continued in Nos. 12 and 13). Groups of Exercises with Iron Wands, with Indian Clubs, on the Horse, and on Horizontal Bar and Parallel Bars combined. The Ferd. Goetz Section of the Leipsic-Lindenau Männerturnverein.

No. 12 (March 21). A Reigen after the Song "Die Wacht am Rhein", by E. Kregenow. Groups of Exercises on the Horse and on the Parallel Bars, by Paul Schäfer. A Christmas Excursion to the Mountains, by Eugen Rentsch. The New Danish Gymnastics, by K. A. Knudsen.

No. 13 (March 28). Travel, by Martha Thurm. Groups of Exercises in Tactics, with Iron Wands, on the Horse, and with Indian Clubs. A Swimming Festival at Frankfurt a.M., by Konrad Böcker. The Condition of the Swiss Confederated Gymnastic Societies in February, 1901.

No. 14 (April 4). Education for Military Service, by Heinrich Stürenburg (continued in Nos. 15 and 16). Swiss Wrestling, by Aug. Frei (concluded in No. 17). A Wand-Reigen, by F. L. Claus. Popular Games and Games for the Young, by Wandt. Prescribed Exercises for Individual Competition on Apparatus at

the 5th Festival of the Italian Gymnastic Federation in Bologna, by Gustav Retzdorff (see also No. 15, p. 283). Extracts from the Annual Report of the Akademischer Turnbund for 1900. Turnvater Jahn in the Novel "Sand" (1859).

No. 15 (April 11). The New Hall of the Stettin Gymnastic Society, by Ludwig Obermeyer. Groups of Free Exercises, and Exercises on the Parallel Bars, the Horizontal Bar, and the Horse, by Rud. Witzgall. Marching in the Army.

No. 16 (April 18). Dr. Karl Wassmannsdorff, on his LXXX. Birthday, by Böttcher (see also No. 18, p. 356). Woldemar Bier, by Lorenz Held. Free Exercises for the XI. Bavarian Gymnastic Festival in Landshut, by J. G. Grotz.

No. 17 (April 25). Axe-shooting in Homer's Odyssey, by Dr. Machnig. Groups of Exercises with Indian Clubs and on the Vaulting Bar, by O. Schumann. Prescribed Exercises for Competition at the 27th Festival of the French Gymnastic Association in Nice, April 7 and 8, 1901, by A. Gelzer.

No. 18 (May 2). A New Gymnastic Apparatus, the "Zweistütz", by Reinhold Franke. Theodor von Heinrichshofen, by Chr. Kohlrausch. Notes from Hungary, by Ferdinand Deutschländer. Recent Changes in the German Turnerschaft, by Dr. Rühl.

No. 19 (May 9). Tactical, Marching and Running Exercises, by Prof. Kessler (continued in No. 23). A Joint Hall for the Gymnastic Societies in Dahme. A Singing Reigen for Women or Older Girls, by L. Schützer. Gymnastic Notes from the Paris Exposition, by Moritz Protze. An Excursion to the Sentis. Review of Schmidt's "Unser Körper", by Dr. Luckow.

No. 20 (May 16). The Introduction of Open-air Games into the Life of the Turnvereine, by Dr. Gasch. August Erbes, by F. Goetz. Groups of Exercises on the Parallel Bars, and on the Horse and Horizontal Bar combined, by Carl Finke. Running Contests in Homer's Odyssey and Iliad, by Dr. Machnig. An Italian Ball-game. The Festival of the French Gymnastic Association in Nice, April 6-8, 1901, by Johs. Temming. A Summary of the Annual Reports of the Branch Societies of the German Turnlehrerverein. A Plan of Work for Branch Societies of the German Turnlehrerverein.

No. 21 (May 23). French Gymnastic Apparatus, by Dr Burgass (concluded in No. 22). Groups of Free Exercises, and Exercises with Rings, on the Horse, and on the Parallel Bars, by Rud. Witzgall. The Question of Inspectors of Gymnastics, by Münch. The Italian Gymnastic Federation, by Gustav Retzdorff.

No. 22 (May 30). A Reigen, by H. Hertel. Graded Groups of Exercises on the Horizontal Bar, by V. Schneider. Gymnastic Competition by Squads, by Dr. H. Gerstenberg.

No. 23 (June 6). The Death of Justus Carl Lion (May 30). The Hall of the Turnverein at Schmölln, by by Franz Neupert. Groups of Exercises with and on Apparatus, by Dr. R. Gasch (concluded in No. 24). An Exhibition of Gymnastic, Athletic and Sporting Goods in Antwerp, April 20-29, by Johs. Temming.

No. 24 (June 13). Gymnastics and Swimming, by Dr. Küppers. The Contest with the Iron Discus in Homer's Iliad, by Dr. Machnig.

No. 25 (June 20). Forgotten Lessons and Exercises of J. C. F. Gutsmuths, by Christian Kohlrausch. Groups of Exercises with and on a Variety of Apparatus (concluded in No. 26). Schrebervereine, by L. Mittenzwey.

No. 26 (June 27). The Results of Inspection of Gymnastic Instruction in the Higher Swiss Folk-schools. Funeral Services over Dr. J. C. Lion, Late Director of School Gymnastics in Leipsic.

F. E. L.

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Allen, Mary E., Allen Gymnasium, St. Botolph street, Boston, Mass.
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Bender, Helen, University of Missouri, Columbia, Mo.
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Bennett, Gazella, Perkins Institute for the Blind, South Boston, Mass.
Bennett, Mary, 46 Rutland square, Boston, Mass.
Benton, Mollie, 60 Whalley avenue, New Haven, Conn.
Bergquist, Nils, Tompkinsville, N. Y. P. O. Box 16.
Bergren, T., Sanitarium, Battle Creek, Mich.
Berlin, Anna, National Military Home, Dayton, O.
Berry, Laura de R., "Lochland," Geneva, N. Y.
Berryman, Clara Maud, 175 W. 11th avenue, Columbus, O.
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Beyer, Henry G., M.D., Ph.D., U. S. Navy Yard, Charlestown, Mass.
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Boas, Franz, Ph.D., 123 W. 82d street, New York City.
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Bohrer, G. G., 96 Baldwin street, Newark, N. J.
Boice, H. B., M.D., State Normal School, Trenton, N. J. P. O. Box 638.
Bojus, G. H., Columbia University, New York City.

Bolin, Jakob, 645 Madison avenue, New York City.
Bolin, Sigrid, 645 Madison avenue, New York City.
Bolster, William Wheeler, Jr., Bates College Gymnasium, Lewiston, Me.
Bond, Sarah A., M.D., 97 Huntington avenue, Boston, Mass.
Boos, Herman J., 225 East 23d street, New York City.
Booth, Harry, 542 West Monroe street, Chicago, Ill.
Boudren, Sara Eleanor, 188 Elmwood avenue, Bridgeport, Conn.
Bowen, Wilbur P., 1009 Packard street, Ann Arbor, Mich.
Bowne, Elizabeth, 2113 N. 21st street, Philadelphia, Pa.
Bowyer, Maud A., M.D., 3630 N. Broad street, Philadelphia, Pa.
Boynton, Frances N., 249 E. Hancock street, Detroit, Mich.
Brackett, E. G., M.D., 133 Newbury street, Boston, Mass.
Bradford, E. H., M.D., 133 Newbury street, Boston, Mass.
Bremner, Elizabeth, 515 Clinton avenue, Brooklyn, N. Y.
Brigham, Agnes Otis, 21 High street, Brookline, Mass.
Britt, Jessie E., Newberg, Oregon.
Brooks, Grace R., 57 Lakeview avenue, Cambridge, Mass.
Brooks, Helen E., 55 Essex avenue, Gloucester, Mass.
Brooks, W. A., M.D., 167 Beacon street, Boston, Mass.
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Brown, Harry, 4 Blandford Gardens, Leeds, England.
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Brunner, Helen M., 167 Brainard street, Detroit, Mich.
Buckman, Mrs. Eugene, 69 Lake place, New Haven, Conn.
Buckman, Eugene, 69 Lake place, New Haven, Conn.
Bugbee, F. F., Y. M. C. A. Training School, Springfield, Mass.
Bullard, W. N., M.D., 89 Marlborough street, Boston, Mass.
Burchenal, Elizabeth, Women's Athletic Club, 150 Michigan avenue, Chicago, Ill.
Burnham, Stella M., Burnham Gymnasium, McGeoch Building, Milwaukee, Wis.
Burton, Mrs. Fannie Cheever, Normal School Gymnasium, Ypsilanti, Mich.
Bush, Charlotte F., Miss Baldwin's School, Bryn Mawr, Pa.
Butler, E. M., 265 W. 139th street, New York City.
Butler, May W., Physical Director, Temple College, Philadelphia, Pa.
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Camann, H. B., 281 South Hoyne avenue, Chicago, Ill.
Campbell, Gertrude, St. James Hotel, Jacksonville, Fla.
Canfield, Ellen Brainard, 3 Reservoir avenue, Ithaca, N. Y.
Cann, F. H., University City of New York, New York City.
Cannon, Mary G., 68 Highland avenue, Newtonville, Mass.
Carne, Charlotte, 12 Madison avenue, Detroit, Mich.
Carrett, Christine J., 11 Ruthven street, Roxbury, Mass.
Carrett, Edna P., 11 Ruthven street, Roxbury, Mass.
Carter, Clara V., 59 Lake place, New Haven, Conn.
Carter, Florence L., B. N. S. Gymnasium, Boston, Mass.
Carter, Marien F., 308 W. 59th street, New York City.
Carter, Vaula, 31 West 55th street, New York City.
Cary, Egbert S., Boarding School, Westtown, Pa.
Centervall, Ivan A., 418 Massachusetts avenue, Boston, Mass.
Chadwick, Florence, 2 Durham street, Boston, Mass.

Chamberlain, Ruth, 63 Franklin square, New Britain, Conn.
Channing, Walter, M.D., corner Boylston street and Chestnut Hill avenue, Brookline, Mass.
Chapin, Jennie E., 333 Prospect street, Willimantic, Conn.
Chaplin, Mabel C., Boston Normal School of Gymnastics, Huntington avenue, Boston, Mass.
Chase, H. Lincoln, M.D., 172 Aspinwall avenue, Brookline, Mass.
Cherry, Mabel, 407 Master street, Philadelphia, Pa.
Chesterton, Thomas, 19 Warmington road, Herne Hill, London, S. E., England.
Childs, Helen F., M.D., 454 Centre street, Jamaica Plain, Mass.
Childs, W. L., Physical Director, Y. M. C. A., Waukesta, Wis.
Churchill, Mary, 10 Astor street, Chicago, Ill.
Clapp, Harriet, 45 Locust Hill avenue, Yonkers, N. Y.
Clark, A. M., M.D., 112 Lincoln avenue, Youngstown, O.
Clark, Clara, 2133 W. 29th avenue, Denver, Col.
Clark, Cora B., State Normal School, Shippensburg, Pa.
Clark, Ellery H., Boston, Mass. P. O. Box 2682.
Clark, Mary George, 3 Gannet street, Roxbury, Mass.
Clarke, John D., M.D., 52 Washington Park, Newtonville, Mass.
Clarke, Mrs. Samuel F., Williams College, Williamstown, Mass.
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Clough, M. Pamelia, 35 Hancock avenue East, Detroit, Mich.
Cober, E. W., 1530 Mt. Vernon street, Philadelphia, Pa.
Coe, Helen L., 639 Congress street, Portland, Me.
Colburn, Lilla B., 251 Alabama avenue, Providence, R. I.
Colby, Jennie M., Colby Gymnasium, Farragut Building, Boston, Mass.
Collins, Lewis, M.D., B. N. S. Gymnasium, Boston, Mass.
Comstock, Clara, Green Hall, University of Chicago, Chicago, Ill.
Conant, Dr. William M., 486 Commonwealth avenue, Boston, Mass.
Coney, Alice B., 31 E. McMillan street, Mt. Auburn, Cincinnati, O.
Connell, Mrs. J., 120 Carnegie Hall, New York City.
Conrad, Elizabeth, 1801 Park avenue, Philadelphia, Pa.
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Coop, William L., Narragansett Machine Co., Providence, R. I.
Coope, Jessie, Hampton Institute, Hampton, Va.
Cory, Alberta Josephine, Harlem Y. W. C. A., 72-74 W. 124th street, New York City.
Corey, William H., Professor, 11 Stone street, Charlestown, Mass.
Cornell, G. A., Y. M. C. A. Training School, Springfield, Mass.
Cornish, Harry S., 349 Madison avenue, New York City.
Cornwell, Ada W., State Normal School, West Chester, Pa.
Court, Mrs. Agnes Lee, 7 Norway street, Boston, Mass.
Cowing, Grace H., 18 Cherry street, Northampton, Mass.
Cowing, Mrs. W. S., 945 Woodlawn street, Germantown, Pa.
Cowles, Edward, M.D., McLean Hospital, Waverley, Mass.
Cowley, J. T., Y. M. C. A. Training School, Springfield, Mass.
Crampton, C. Ward, M.D., 160 W. 119th street, New York City.
Crawford, S. May, Deaf Mute Institute, Little Rock, Ark.
Cross, A. L., Malden, Mass.
Cummings, Edith L., Normal Hall, Westfield, Mass.
Cummings, Gertrude, B. N. S. Gymnasium, Boston, Mass.
Cummings, W. S., M.D., Swarthmore College, Swarthmore, Pa.
Curtis, Charles P., 40 Fairfield street, Boston, Mass.
Curtiss, Frank Homer, Director Physical Training, University of Texas, Austin, Tex.
Cushing, Ellen M., 10 Prospect street, Fitchburg, Mass.
Cutler, Harriet S., Charlesbank Women's Gymnasium, Boston, Mass.

Cutting, Elfrida, 811 Whitney avenue, New Haven, Conn.
Darling, E. A., M.D., 1603 Massachusetts avenue, Cambridge, Mass.
Davis, Elizabeth A., 114 N. Prince street, Lancaster, Pa.
Davis, Helen Alling, 2 Avondale Park, Rochester, N. Y.
Davis, Walter W., Iowa College, Grinnell, Ia.
Day, William E., Y. M. C. A., Dayton, O.
Deane, Eleanor R., Grundmann Studios, Clarendon street, Boston, Mass.
De'Bermingham, Mrs. J. A., 106 W. 45th street, New York City.
DeGroot, Edw. B., Lewis Institute, Chicago, Ill.
DeLaney, Louise, 198 Delaware avenue, Buffalo, N. Y.
Denig, Blanche A., M.D., "The Bristol," corner Boylston and Clarendon streets, Boston, Mass.
Denman, W. V., care Y. M. C. A., New Haven, Conn.
Devold, A. H., 225 W. 42d street, New York City.
Diall, Florence S., 817 S. 7th street, Terre Haute, Ind.
Dickinson, Alice, Leland Stanford University, Cal.
Dithridge, Louise Mary, 25 Harper avenue, Detroit, Mich.
Dodge, F. H., Rutgers College, New Brunswick, N. J.
Dodge, Grace H., 262 Madison avenue, New York City.
Doehla, Adam, 602 Courrier street, McKeesport, Pa.
Doggett, L. L., Y. M. C. A. Training School, Springfield, Mass.
Doherty, Helen I., M.D., 1690 Washington street, Boston, Mass.
Dohs, Francis, 65 Hammond street, Cambridge, Mass.
Dolan, Nellie, Central place Jamaica Plain, Mass.
Dole, Edith Avery, St. Mary's Hall, Burlington, N. J.
Donnelly, Mrs. M. J., 184 Amity street, Brooklyn, N. Y.
Dorsey, Anastasia, 105 Dwight street, New Haven, Conn.
Douthitt, Prof. A. G., Y. M. C. A., Seattle, Wash.
Douthitt, C. M., Y. M. C. A., Calumet, Mich.
Dudley, Gertrude, Kelly Hall, Chicago University, Chicago, Ill.
Dunham, Edith Riteman, 113 20th street, Milwaukee, Wis.
Dutton, Hope, 23 Arm street, Wakefield, Mass.
Dutton, Samuel T,, Teachers' College, New York City.
Dwight, Minnie T., 103 W. 55th street, New York City.
Earl, E. C., Box 201, Association Building, Chicago, Ill.
Earl, George H., M.D., 153 Newbury street, Boston, Mass.
Eaton, Katherine E., 40 Berkeley street, Boston, Mass.
Ebel, Frederick, 12 Warren street, New Haven, Conn.
Eberhard, Christian, Athletic Club, Exeter street, Boston, Mass.
Edmunds, Edna, 520 Kingsbridge road, Fordham, N. Y.
Ehinger, C. E., M.D., State Normal School, West Chester, Pa.
Ehinger, Mrs. C. E., State Normal School, West Chester, Pa.
Ehler, George W., Central Y. M. C. A., 153 LaSalle street, Chicago, Ill.
Elkinton, Thomas, 121 S. 3d street, Philadelphia, Pa.
Elliott, Gabriella Wilson, 1020 Prospect street, Cleveland, O.
Elliott, Lillian, 269 Eastern avenue, Malden, Mass.
Ellis, A. Caswell, University of Texas, Austin, Tex.
Elsom, J. C., M.D., University of Wisconsin, Madison, Wis.
Ely, Prof. M. R., Ellensburg, Wash.
Enebuske, Claës J., M.D., Ph.D., 419 Boylston street, Boston, Mass.
Ensworth, William H., M.D., 40 Princeton street, Boston, Mass.
Erd, Robert, Waterloo, Ill.
Esley, Hanna, 105 Dwight street, New Haven, Conn.
Evans, Nettie Anne, 202 Manchester street, Battle Creek, Mich.
Everhard, Lottie O., Yankton College, Yankton, S. D.
Ewerhardt, Frank H., Yale Gymnasium, New Haven, Conn.
Faries, Randolph, M.D., 2007 Walnut street, Philadelphia, Pa.
Farquhar, Sarah Brooke, Rockville, Md.

Feld, Mrs. Louis, 2036 N. 32d street, Philadelphia, Pa.
Fels, Maurice, 1312 Franklin street, Philadelphia, Pa.
Fernald, Ethel, 53 Youle street, Melrose, Mass.
Fessenden, Elizabeth M., 73 Stinson place, Detroit, Mich.
Fetzer, Katherine, School for Deaf and Dumb, Romney, W. Va.
Fish, A. L., Bridgeport, Conn.
Fish, Mary C., Rockford College, Rockford, Ill.
Fisher, Julia Y., W. C. A., Detroit, Mich.
Fitz, George Wells, M.D., 483 Beacon street, Boston, Mass.
Fitzgerald, Edwin Gerald, Y. M. C. A., Sewickley, Pa.
Fitzgerald, James, M.D., School Committee Rooms, Mason street, Boston, Mass.
Fitzpatrick, Keene, East University avenue, Ann Arbor, Mich.
Fleming, Katharine M., 94 Howard street, Cohoes, N. Y.
Foglesong, Nellie A., 418 Salem avenue, Dayton, O.
Foley, Anna G., 26 Mulberry street, Worcester, Mass.
Ford, J. S., 153 LaSalle street, Chicago, Ill.
Ford, W. A., M.D., N. E. corner 15th and Locust streets, Philadelphia, Pa.
Foster, Alice B., M.D., Baldwin Cottage, Oberlin, O.
Foster, E. H. T., Box 201, Association Building, Chicago, Ill.
Fotheringham, Elizabeth Robb, 15 Ellsworth avenue, Cambridge, Mass.
Fowler, Lora Douglas, 1101 Douglas street, Sioux City, Ia.
Fowler, William E., Whitney House, Westborough, Mass.
Freeston, Mary Cecil, 6 W. 107th street, New York City.
Freiberg, Albert H., M.D., 706 Walnut avenue, Cincinnati, O.
Frothingham, Helen H., 105 Gates avenue, Brooklyn, N. Y.
Gammon, Montague, Rome, Georgia.
Garlock, Lunette M., 18 Eld street, New Haven, Conn.
Garside, Martha, Pratt Institute, Brooklyn, N. Y.
Gerrish, Charlotte Bigelow, State Normal School, Stevens Point, Wis.
Gilbert, Melvin B., 211 Huntington avenue, Boston, Mass.
Gilman, Grace M., 8 Harris avenue, Jamaica Plain, Mass.
Gilman, Susan H., Miss Master's School, Dobbs Ferry, N. Y.
Goetz, Hans, 606 Wood street, Philadelphia, Pa.
Goldie, George, Princeton, N. J.
Goldsmith, Carrie, The Eden, Grand street, Cincinnati, O.
Goldthwait, J. E., M.D., 372 Marlborough street, Boston, Mass.
Goodhue, Joseph A., Y. M. C. A., New Rochelle, N. Y.
Gordon, Elizabeth F., Gloucester, Mass. P. O. Box 37.
Graham, Marion N., Aspinwall avenue, Brookline, Mass.
Grant, Dr. J. Edward, Y. M. C. A., 208 Second avenue, New York City.
Green, E. E., University of Rochester, Rochester, N. Y.
Green, Grace G., Institute for Deaf and Dumb, Mt. Airy, Pa.
Greene, Alma L., 72 Hall street, Waltham, Mass.
Greenwald, James A., 6933 Hamilton avenue, Pittsburg, Pa.
Grobb, F. I., Y. M. C. A. Training School, Springfield, Mass.
Grosvenor, Edith Louise, 1210 G street, N. W., Washington, D. C.
Groszmann, Maximilian P. E., M.D., Fort Washington avenue and Depot lane, New York City.
Grumman, Carrie L., 197 Blatchley avenue, New Haven, Conn.
Gulick, Luther, M.D., Pratt Institute, Brooklyn, N. Y.
Gwathmey, James T., M.D., Vanderbilt University, Nashville, Tenn.
Haagenson, Mary S., 15 Malvern street, Dorchester, Mass.
Hadcock, B. R., Y. M. C. A. Training School, Springfield, Mass.
Haines, Lynda, 90 Whalley avenue, New Haven, Conn.
Hall, Carolyn Ladd, M.D., Haverford College, Haverford, Pa.
Hall, Mary H., 10 Durham street, Boston, Mass.
Hall, R. Warren, 702 Fourth avenue, St. Cloud, Minn.

Hallbeck, Axel C., 22 W. 60th street, New York City.
Hallett, Mrs. C. C., 469 Columbus avenue, Boston, Mass.
Halliday, Mabel, North Bend, O.
Halsted, A. T., M.D., 31 W. 55th street, New York City.
Hammett, Charles Edw., Tome Institute, Port Deposit, Md.
Hanna, Delphine, M.D., 47 S. Professor street, Oberlin, O.
Hanrahan, Mrs. J. L., 308 W. 59th street, New York City.
Hanus, Paul H., Professor, 60 Buckingham street, Cambridge, Mass.
Harrison, J. Henry, Sandow's School, Conquit and Bold streets, Liverpool, England.
Hartung, Henry, M.D., 596 Sheffield avenue, Chicago, Ill.
Hartwell, E. M., M.D., Ph.D., Room 71, City Hall, Boston, Mass.
Harvey, Alice M., 735 E. 14th avenue, Denver, Col.
Harvey, Elma L., 610 B street, N. E., Washington, D. C.
Harvey, Frederick James, 70 St. Sidwell, Exeter, Devonshire, England.
Hastings, William W., Professor, Y. M. C. A. Training School, Springfield, Mass.
Haug, Emmanuel, 60 W. 13th street, New York City.
Haupt, Minnie, 96 York square, New Haven, Conn.
Hayes, M. T., Trinity School, W. 93d street, New York City.
Hayward, Francis J., 379 Fifth street, Brooklyn, N. Y.
Hazen, Charlotte, 237 E. 104th street, New York City.
Healey, Frances, 678 Main street, Worcester, Mass.
Heath, Florence, 95 W. Third street, Mansfield, O.
Hebbert, Oliver L., Y. M. C. A., 519 Westminster street, Providence, R. I.
Hellrung, Axel, "The Netherland," New York City.
Helm, J. R., 745 E. 137th street, New York City.
Henay, Frances A., N. E. Conservatory of Music, Boston, Mass.
Henckel, George, Y. M. C. A. Training School, Springfield, Mass.
Hendrick, Mrs. Bertha J., 361 Stuyvesant street, Brooklyn, N. Y.
Hepbron, George T., 3 W. 29th street, New York City.
Hermann, Ernest, Foxboro, Mass. P. O. Box 103.
Herrick, Elizabeth, 4 Riedesel avenue, Cambridge, Mass.
Hervey, Mary B., State Normal School, New Palz, N. Y.
Herzog, G. L., 29 E. 34th street, Bayonne, N. J.
Hetherington, Clark W., University of Missouri, Columbia, Mo.
Heywood, C. E. A., Y. M. C. A., Plainfield, N. J.
Hicks, Mrs. Mary Dana, 366 Commonwealth avenue, Boston, Mass.
Hill, A. R., M.D., University of Nebraska, Lincoln, Neb.
Hill, Amy R., 41 Maple street, Stoneham, Mass.
Hill, Edith L., 37 Prospect street, Woonsocket, R. I.
Hill, Lucile E., Wellesley College, Wellesley, Mass.
Hills, Katherine L., 202 Windsor avenue, Hartford, Conn.
Hills, Laura K., 315 Madison avenue, Scranton, Pa.
Hillyer, J. Blake, 23 Tompkins avenue, New Brighton, Staten Island, N. Y.
Hinkley, Augusta, 194 Joralemon street, Brooklyn, N. Y.
Hintz, Ernest, 1176 Chapel street, New Haven, Conn.
Hitchcock, E., M.D., Amherst College, Amherst, Mass.
Hodges, Anne, 26 Perrin street, Roxbury, Mass.
Hodgson, Edith, 44 Downing street, Brooklyn, N. Y.
Hogan, Sophie S., 416 W. 118th street, New York City.
Holman, Frank, Y. M. C. A., London, Ontario.
Holmes, David H., Waverley, Mass.
Holmes, Elizabeth G., West Chester Normal School, West Chester, Pa.
Holmstrom, Miss V. M., Royal Victoria College, Montreal, Canada.
Holt, Jacob F., M.D., 1935 Poplar street, Philadelphia, Pa.
Homans, Amy Morris, Normal School of Gymnastics, Huntington avenue, Boston, Mass.

Hopkins, Maude C., Drexel Institute, Philadelphia, Pa.
Horton, Clara J., 14 West 104th street, New York City.
Hough, Theodore, M.D., Massachusetts Institute of Technology, Boston, Mass.
Howard, Alonzo G., M.D., West Roxbury, Mass.
Hubbard, Charles W., 133 Essex street, Boston, Mass.
Hubbard, Mary, "The Warren," Roxbury, Mass.
Hughes, Annie Rennard, 1006 New Hampshire avenue, Washington, D. C.
Hughes, Dr. Laura A., 397 Boylston street, Boston, Mass.
Huling, Ray Greene, Ph.D., 101 Trowbridge street, Cambridge, Mass.
Hunter, Marion D., Pratt Institute, Brooklyn, N. Y.
Hutchinson, Harriet E., 124 Huntington avenue, Boston, Mass.
Jacob, Anna Gertrude, 160 Grand street, Newburgh, N. Y.
Jacob, Florence, 253 Arlington avenue, Jersey City, N. J.
Jacobs, Minnie Anne, 158 W. 106th street, New York City.
Jacobs, Sarah J., 845 S. Hope street, Los Angeles, Cal.
James, Francis B., Pike Building, Cincinnati, O.
Jennings, Mary Kirby, 43 West street, South Norwalk, Conn.
Joerg, Oswald, M.D., 12 Schermerhorn street, Brooklyn, N. Y.
Johnson, Fanny L., 16 Prospect avenue, Wollaston, Mass.
Johnson, Florence May, Insane Hospital, Northampton, Mass.
Johnson, Frances Hunt, Sag Harbor, Long Island, N. Y.
Johnson, G. E., University School, Cleveland, O.
Johnson, Iris Leighton, 240 E. College street, Oberlin, O.
Johnson, Susan Maud, Dixon House, Westerly, R. I.
Johnson, Theodora G., 29 Wendell street, Cambridge, Mass.
Jones, Agnes A., 123 McDonough street, Brooklyn, N. Y.
Jones, E. A., Superintendent Public Schools, Massillon,, O.
Jones, L. H., Superintendent Schools, 190 Euclid avenue, Cleveland, O.
Jones, Mary Miller, 1710 Chestnut street, Philadelphia, Pa.
Jordan, Ella C., 178 Newbury street, Boston, Mass.
Junkins, Helen M., 6 Green street, Lawrence, Mass.
Kallenberg, Henry F., 705 Association Building, Chicago, Ill.
Keller, Eckhardt, Section and Foraker avenues, Norwood, O.
Kellogg, J. H., M.D., Battle Creek, Mich.
Kells, Blanche, 38 Linwood street, New Haven, Conn.
Kelly, M. Emma, 524 Penn avenue, Pittsburg, Pa.
Kendrick, Jean, 9 Lindsley avenue, South Nashville, Tenn.
Kerr, Agnes J., 148 Chandler street, Boston, Mass.
Kershaw, W. L., Y. M. C. A., Melrose, Mass.
Kimball, Grace W., M.D., Vassar College, Poughkeepsie, N. Y.
Kimble, Charles, Y. M. C. A., Brooklyn, N. Y.
Kincade, Katharine J., 22 Sadler street, Gloucester, Mass.
Kindewater, A. E., 1205 Dillon street, St. Louis, Mo.
King, Mrs. Bessie M., 1410 Bacon street, N. W., Washington, D. C.
King, Mrs. Morris L., 264 W. 57th street, New York City.
Kinnicutt, William H., M.D., 246 Prospect street, Cleveland, O.
Kistler, Theodore, 734 W. Lexington street, Baltimore, Md.
Kite, Anna S., 320 N. 40th street, Philadelphia, Pa.
Knapp, H. B., care of A. M. M. C., Battle Creek, Mich.
Knapp, John B., M.D., 62 West 51st street, New York City.
Knapp, Marion, 20 Chestnut street, Boston, Mass.
Knoch, Arthur A.. M.D., 2654 Belleview avenue, Mt. Auburn, Cincinnati, O.
Kroh, Carl J., University of Chicago, Chicago, Ill.
Kuhn, Esther, 429 Green street, Philadelphia, Pa.
Lambeth, W. A., M.D., University of Virginia, Charlottesville, Va.
Lang, C. G., M.D., Y. M. C. A., Trenton, N. J.

Lathrop, Edith, 211 Burt street, Syracuse, N. Y.
Lawrence, Miss C. T., care of F. W. Murray, Lawrence, Queens Co., N. Y.
Lawrence, Emily, Trenton, N. J. P. O. Box 747.
Lawrence, Mrs. Margaret Stanton, 250 W. 94th street, New York City.
Lee, Joseph, 1 Beacon street, Boston, Mass.
LeGarde, Ellen, 10 Mawney street, Providence, R. I.
Legget, Alice E., Y. W. C. A., Topeka, Kan.
Leibold, Anton, 345 E. Kossuth street, Columbus, O.
Leiter, Mrs. Frances W., 220 West Park avenue, Mansfield, O.
Leland, Arthur, University of Denver, University Park, Col.
Leonard, F. E., M.D., Oberlin College, Oberlin, O.
Lesser, Rebecca, 27 W. 118th street, New York City.
Leveau, Emma, 32 Beacon street, Gloucester, Mass.
Levy, Mildred J., 670 Rockdale avenue, Avondale, Cincinnati, O.
Lewis, S. A., 222 Bowery, New York City.
Leyde, Nellie E., 110 S. 3d street, Cedar Rapids, Ia.
Leyerzapf, Louis, 545 Grand avenue, New Haven, Conn.
Lincoln, D. F., M.D., 84 Myrtle street, Boston, Mass.
Lincoln, Mrs. John J., Elkhorn, McDowell Co., W. Va.
Lindley, Marguerite E., Murray Hill Hotel, New York City.
Livermore, H. Louise, 100 Howe street, New Haven, Conn.
Longfellow, Mrs. H. H., 1 Belleview avenue, North Cambridge, Mass.
Lorett, John, 2139 Vine street, Baltimore, Md.
Love, Edith Maclure, Director, Physical Training for Women, Indiana State Normal School, Terre Haute, Ind.
Lovett, Robert W., M.D., 234 Marlborough street, Boston, Mass.
Luchey, Prof. G. W. A., University of Nebraska, Lincoln, Neb.
Ludlum, Mrs. Mary Hogan, 2901 Lucas avenue, St. Louis, Mo.
Lyon, May B., 100 Howe street, New Haven, Conn.
Lyon, W. F., Olivet, Mich.
Maccarty, Martha E., 215 Brattle street, Cambridge, Mass.
Mackdermott, W. M., Johns Hopkins University, Baltimore, Md.
MacMartin, Elizabeth C., 305 W. 97th street, New York City.
Magee, Walter Edmund, University of California, Berkeley, Cal.
Mangam, Emily C., 290 Stuyvesant avenue, Brooklyn, N. Y.
Mann, Mary Ida, Normal School, Ypsilanti, Mich.
Manrique, R. E., 214 W. 83d street, New York City.
Marston, Florence H., Convent station, Morris Co., N. J.
Marsh, Bessie K., 473 W. 145th street, New York City.
Martin, Eva M., 7 James street, Boston, Mass.
Martin, William H., Physical Director, Alfred Corning Clark Gymnasium, Cooperstown, Otsego Co., N. Y. Box 667.
Marvel, Fred W., Physical Director, Wesleyan University, Middletown, Conn.
Marvin, Julia R., 88 Perry street, Brookline, Mass.
Mason, Ellen F., 1 Walnut street, Boston, Mass.
Massman, R. C., Y. M. C. A., Springfield, Mass.
Mathews, Clara A., 127 Prospect place, Brooklyn, N. Y.
Maxwell, Juliette, Indiana University, Bloomington, Ind.
May, Eva G., Vassar College, Poughkeepsie, N. Y.
May, George, University of Michigan, Ann Arbor, Mich.
Mayhew, Abbie S., Ladies Hall, Madison, Wis.
Mayser, Charles W., Yale Gymnasium, New Haven, Conn.
McBride, Jennie Louise, 49 E. 106th street, New York City.
McCastline, W. H., 318 W. 57th street, New York City.
McComber, S. A., Worcester Academy, Worcester, Mass.
McCurdy, James H., M.D., 308 Eastern avenue, Springfield, Mass.
McIntire, Mrs. Herbert J., Virginia Polytechnic Institute, Blacksburg, Va.

McKenzie, A. G., 143 Newbury street, Boston, Mass.
McKenzie, Annie, 156 Charles street, Boston, Mass.
McKenzie, B. E., M.D., 12 E. Bloor street, Toronto, Canada.
McKenzie, R. Tait, M.D., 913 Dorchester street, Montreal, Canada.
McLaren, G. A., Y. M. C. A. Training School, Springfield, Mass.
McLean, Agnes M., State Normal School, Baltimore, Md.
McLeod, Mary L., Cornell College, Mt. Vernon, Ia.
McNamara, Adelaide R., 32 Masonic street, Rockland, Me.
McPherson, Mrs. Ella A., 208 Mercer street, Trenton, N. J.
Membery, Ada, 131 Livingston street, Brooklvn, N. Y.
Merry, Mrs. Alice, Haskell Home, Battle Creek, Mich.
Metzner, Henry, 2400 Bathgate avenue, New York City.
Meylan, George L.. 151 Hillside street, Roxbury, Mass.
Miller, Caspar W., M.D., Wallingford, Pa.
Miller, Frank E., Physical Director, Y. M. C. A., Dallas, Tex.
Miller, Sarah E., 10 Durham street, Boston, Mass.
Minott, J. J., M.D., 188 Marlborough street, Boston, Mass.
Monahan, Otto F., The Hotchkiss School, Lakeville, Conn.
Moon, Schuyler B., McDonogh School, McDonogh, Md.
Moore, Henrietta F. R., 117 Edmund place, Detroit, Mich.
Moores, Frances, Dr. Sargent's Normal School, Church street, Cambridge, Mass.
Morris, A. W., Box 201, Association Building, Chicago, Ill.
Morris, Frances M., M.D., 138 Marlborough street, Boston, Mass.
Morris, Mary Cox, 413 W. 46th street, New York City.
Morgan, Mrs. L. B., 2731 Broadway, New York City.
Morgan, Anna, 138 York street, New Haven, Conn.
Morrison, May F., 424 W. 20th street, New York City.
Morse, H. Francis, Battersea Polytechnic, London, S. W., England.
Morse, Mabel S., 31 Bicknell street, New Dorchester, Mass.
Moseley, Ada May, 85 St. Marks avenue, Brooklyn, N. Y.
Moses, Charles, 15 Blake street, Westboro, Mass.
Moses, Nina J., 17 Ellis street, Roxbury, Mass.
Mosher, Eliza M., M.D., University of Michigan, Ann Arbor, Mich.
Mott, Emma L., 62 Catherine street, Poughkeepsie, N. Y.
Moulton, Frances, 1 W. 87th street, New York City.
Mulliner, Mary Rees, M.D., 201 Clarendon street, Boston, Mass.
Munger, Miss E. Van A., 218 Washington avenue, Brooklyn, N. Y.
Murray, Henrietta A., 78 Jacques avenue, Worcester, Mass.
Musselman, Frances, Stevens Point, Wis.
Narey, Hope W., Durant Gymnasium, Berkeley, corner Appleton street, Boston, Mass.
Neal, Mrs. Helen P., Knox College, Galesburg, Ill.
Neilson, Jennet D. 1238 Beaubien street, Detroit, Mich.
Nelligan, Richard F., Amherst College, Amherst, Mass.
Nicolai, Sophie J., 61 E. 121st street, New York City.
Nissen, Hartvig, Newburg street, Roslindale, Mass.
Norman, Corinne B. Van, 255 Homer street, Newton Centre, Mass.
Norris, Miss J. A., M.D., 7338 Stewart avenue, Chicago, Ill.
Norvell, P. Eleanore, care of Miss Florence Whitis, Whitis avenue and 627th street, Austin, Tex.
O'Connor. Mary Josephine, 187 Camp street, Providence, R. I.
Offutt, Florence, Meadowthorpe, Lexington, Ky.
Oliver, Henry K., M.D., The Union Club, 8 Park street, Boston, Mass.
Oothout, Augusta, 5 Ida Terrace, Troy, N. Y.
Osborne, Alice, 117 W. 58th street, New York City.
Osgood, Carrie S., 7 Upton street, Boston, Mass.
Otis, Edward O., M.D., 308 Commonwealth avenue, Boston, Mass.

Oye, A. A., 150 E. 71st street, New York City.
Page, Calvin G., M.D., 128 Marlborough street, Boston, Mass.
Page, Nina A., State Normal School, Platteville, Wis.
Paige, Caroline M., 30 Clifton place, Brooklyn, N. Y.
Paine, Mrs. Charles A., 39 School street, East Providence, R. I.
Palmer, Cora Ellen, Emerson Hall, Beloit, Wis.
Palmie, Therese K., 171 Warren street, Brooklyn, N. Y.
Park, Miss K. B., 645 Madison avenue, New York City.
Parker, Fred E., Brown University Gymnasium, Providence, R. I.
Parker, Jacob, 1295 Union avenue, New York City.
Parker, May E., Valley Falls, N. Y.
Patrick, Augusta L., 47 S. Fullerton avenue, Montclair, N. J.
Patterson, Ethel, Brownell Hall, Omaha, Neb.
Patterson, J. B., Oregon Agricultural College, Corvallis, Ore.
Peabody, Frank E., 120 Commonwealth avenue, Boston, Mass.
Pearse, Alice W., 317 Walnut avenue, Roxbury, Mass.
Pearson, Henry F., 542 Larchmont avenue, Ravenswood Station, Chicago, Ill.
Pearson, W. R., Y. M. C. A., Covington, Ky.
Peck. Katharine B., 132 W. 12th street, New York City.
Peckham, Ellery G., Stamford, Conn. P. O. Box 557.
Peet, Walter, M.D., Yonkers, N. Y.
Pennycook, Jean, 158 East Elizabeth street, Detroit, Mich.
Perrin, Ethel, Boston Normal School of Gymnastics, Huntington avenue, Boston, Mass.
Perry, Elizabeth W., 120 5th street, Pittsburg, Pa.
Perry, Florence L., Braintree, Mass.
Pertuch, Prof. Richard, 2144 North Natrona street, Philadelphia, Pa.
Peterson, Clark K., University Elementary School, 5412 Ellis avenue, Chicago, Ill.
Peterson, Ellis, 305 Chestnut avenue, Jamaica Plain, Mass.
Petitte, May, 74 Whalley avenue, New Haven, Conn.
Pettit, H. S., M.D., Adelphi Academy, Brooklyn, N. Y.
Pfister, Franz, M.D., 760 3d street, Milwaukee, Wis.
Phillips, Mary R., 415 Fourth street, N. W., Washington, D. C.
Phillips, Paul C., M.D., Pratt Gymnasium, Amherst, Mass.
Pierce, Elizabeth, 464 West 146th street, New York City.
Pierce, J. M., Southern Illinois State Normal University, Carbondale, Ill.
Pitkin, Agnes Belle, 816 Union street, Schenectady, N. Y.
Plant, John W., 224 Harrison street, Syracuse, N. Y.
Plummer, Laura S., 110 Princeton street, East Boston, Mass.
Pohl, Elsa, 60 Whalley avenue, New Haven, Conn.
Poley, Grace S., Riverside, Cal. P. O. Box 1124.
Poos, E. A., M.D., 4235 Cherry street, Northside, Cincinnati, O.
Porter, William T., M.D., Harvard Medical School, Back Bay, Boston, Mass.
Posse, Baroness Rose, 206 Massachusetts avenue, Boston, Mass.
Potter, Mary G., 39 W. 60th street, New York City.
Powter, C. B., High School, Montreal, Canada.
Pray, Mabel L., "The Monticello," Toledo, O.
Prentiss, Lory, Lawrenceville, N. J.
Prescott, W. H., M.D., 285 Marlborough street, Boston, Mass.
Printz, B. G., West Virginia University, Morgantown, W. Va.
Pyle, Oline, Landenburg, Pa.
Randall, Harriet, Wellesley College, Wellesley, Mass.
Raycroft, J. E., M.D., University of Chicago, Chicago, Ill.
Reed, Mary A., 124 Macon street, Brooklyn, N. Y.
Reeve, J. C., M.D., S. W. corner 3d and Wilkinson streets, Dayton, O.

Requa, M. Augusta, M.D., 65 W. 52d street, New York City.
Rew, Jennie M., 307 York street, New Haven, Conn.
Richards, Eugene L., Professor, Yale University, New Haven, Conn.
Richardson, Eldora K., 953 President street, Brooklyn, N. Y.
Richardson, Georgiana, 116 Ashland avenue, Malden, Mass.
Rideout, Mel B., Y. M. C. A., Washington, D. C.
Riedel, Adolf, 1809 Montford avenue, Baltimore, Md.
Riel, Ida V., M.D., Coatesville, Chester Co., Pa. Box 592.
Robbins, Mrs. Bessie L., 1 Winter street, Salem, Mass.
Robinson, Edith T., 15 N. Broadway, Yonkers, N. Y.
Robinson, Lucy W., 74 Lake place, New Haven, Conn.
Rockwell, Frances, 124 Halsey street, Brooklyn, N. Y.
Rogers, Helen H., 35 Washington street, Beverly, Mass.
Rogers, J. F., 143 N. Clark street, Chicago, Ill.
Rogers, Margaret Fuller, 130 13th street, Milwaukee, Wis.
Ronan, Bertha M., Crystal Falls, Mich. P. O. Box 194.
Ross, Blanche, Searsport, Me.
Ross, Howard Andrew, Phillips Exeter Academy, Exeter, N. H.
Rosseter, Louise Webster, Dewey House, Northampton, Mass.
Rous, Leila R., 126 Massachusetts avenue, Boston, Mass.
Routzahn, E. G., 1 Sunset place, Dayton, O.
Russell, Laura S., 13 Woodville Park, Roxbury, Mass.
Russell, Leon, Methuen, Mass.
Sabine, Jane D., 481 Beacon street, Boston, Mass.
Sackett, Harriet S., Pratt Institute, Brooklyn, N. Y.
Saller, Mabel, 188 St. Nicholas avenue, New York City.
Sanborn, Frances S., 24 Langdon street, Cambridge, Mass.
Sanborn, Helen M. S., 41 Walnut street, Oneonta, N. Y.
Sanborn, Lura W., 6553 Harvard avenue, Chicago, Ill.
Sandman, Ida, 163 E. 89th street, New York City.
Sanford, Willard A., 75 Rosette street, New Haven, Conn.
Sargent, Dudley A., M.D., Hemenway Gymnasium, Cambridge, Mass.
Savage, W. L., M.D., 308 W. 59th street, New York City.
Sawtelle, Ellen C., Hancock School, Boston, Mass.
Sawyer, Edith, Plattsville, N. Y.
Sawyer, Mary Esther, Framingham, Mass.
Scales, Carrie Louise, 475 Centre street, Newton, Mass.
Scarborough, Emily B., State Normal School, New Britain, Conn.
Scharrar, Josephine, Light House Depot, New Brighton, N. Y.
Schetky, Mary E., 911 S. 48th street, Philadelphia, Pa.
Schlesinger, Mrs. B., Brookline, Mass.
Schlick, Agnes, 1822 6th street, Harrisburg, Pa.
Schlissel, Hermann, Turn Halle, New Haven, Conn.
Schmitt, Louis M., 70 Wyman street, Jamaica Plain, Mass.
Scholtz, Karl A. M., 108 E. Saratoga street, near St. Paul street, Baltimore, Md.
Schulz, C. F. E., 1102 Myrtle avenue, Baltimore, Md.
Schultz-Hopf, Elsa, 307 N. State street, Ann Arbor, Mich.
Scott, J. R., Syracuse University Gymnasium, Syracuse, N. Y.
Scott, Mary, M.D., 603 E. Genesee street, Syracuse, N. Y.
Scudder, Mrs. William M., 604 Division street, Chicago, Ill.
Seabrook, H. H., M.D., 118 E. 72d street, New York City.
Sears, Edith Thatcher, 45 Lyndhurst street, Dorchester, Mass.
Seaver, Jay W., M.D., Yale University Gymnasium, New Haven, Conn.
Seeley, Mollie, 1289 Commonwealth avenue, Allston, Mass.
Seerley, F. N., M.D., Y. M. C. A. Training School, Springfield, Mass.
Seibert, Herman, 582 E. 157th street, New York City.
Seiffert, B., 506 Joe Compeau avenue, Detroit, Mich.

Seikel, Rupert, Columbia Gymnasium, 119th street and Amsterdam avenue, New York City.
Seuss, Nicholas, 3229 Bishop street, Cincinnati, O.
Seward, Mary, 113 West 85th street, New York City.
Shaffer, S. LeRoy, 63 Lexington avenue, Brooklyn, N. Y.
Shannahan, Rev. J. W., Supt. Parochial Schools, Philadelphia, Pa.
Shaw, Sarah, 56 Parsons street, Brighton, Mass.
Shepardson, Grace, 18 Maple avenue, Newton, Mass.
Sherrard, Evelyn B., Wellesley College, Wellesley, Mass.
Simonson, Edith, Bodine street, West New Brighton, N. Y.
Skarstrom, William, 18 Greenwich Park, Boston, Mass.
Skeele, Otis C., 112 West Second street, Mt. Vernon, New York.
Slack, Florence H., 1240 Westminster street, Providence, R. I.
Slater, Eleanor M., Adams Nervine Asylum, Jamaica Plain, Mass.
Slocum, Benita V., The Slocum Gymnasium, Bridgeport, Conn.
Smart, Alice M., 545 W. 148th street, New York City.
Smart, Isabella, 307 W. 46th street, New York City.
Smedley, Caroline W., 4661 Penn street, Frankford, Pa.
Smedley, Emily C., 335 Williams street, East Orange, N. J.
Smith, Adela J., 184 Gregory avenue, Passaic, N. J.
Smith, Beulah L., 60 W. Chestnut street, Rondout, N. Y.
Smith, Eva J., 64 Commonwealth avenue, Boston, Mass.
Smith, J. Gardner, M.D., 21 W. 122d street, New York City.
Smith, Linden P., 542 W. Monroe street, Chicago, Ill.
Smith, Louisa, M.D., Bryn Mawr, Pa.
Smith, Mrs. N. V. D., 615 Willoughby avenue, Brooklyn, N. Y.
Smith, Sadie E., 504 University avenue, Ithaca, N. Y.
Snow, Dr., Leland Stanford, Jr., University, Palo Alto, Cal.
Snyder, Alice G., Women's Gymnasium, University of Michigan, Ann Arbor, Mich.
Spencer, Caroline, M.D., 1320 N. Nevada avenue, Colorado Springs, Col.
Spicer, Margaret R., Winchester, Mass.
Spiegle, Grace E., M.D., Normal School, 13th and Spring Garden streets, Philadelphia, Pa.
Spills, Adelaide, 754 W. 7th street, Cincinnati, O.
Spore, Nellie Amelia, Director Gymnasium, Mt. Holyoke College, South Hadley, Mass.
Stagg, A. Alonzo, University of Chicago, Chicago, Ill.
Stecher, William A., 2825 Russell avenue, St. Louis, Mo.
Stedman, Alice, 6 Monadnock street, Dorchester, Mass.
Sterling, E. Blanche, 2422 Maryland avenue, Baltimore, Md.
Stevenson, David W., M.D., Main and 8th streets, Richmond, Ind.
Stilwell, W. A., Y. M. C. A., Lafayette, Ind.
St. John, Ida, Downer College, Milwaukee, Wis.
Stone, Miss J. G., 133 Bellevue avenue, Melrose, Mass.
Stone, James S., M.D., 146 Marlborough street, Boston, Mass.
Stoner, Elizabeth R., Sterrett School, Lang avenue, Pittsburg, Pa.
Stoneroad, Rebecca, 1330 Wallach place, Washington, D. C.
Stroud, C. C., M.D., Tufts College, Mass.
Studer, A. G., Y. M. C. A., Detroit, Mich.
Sturrock, Alexander, Superintendent Dundee Public Gymnasium, Dundee, Scotland.
Suder, Henry, 1619 Grace street, Chicago, Ill.
Suiter, Charles E., Western University of Pennsylvania, Allegheny, Pa.
Sullivan, J. E., Y. M. C. A. Training School, Springfield, Mass.
Sultan, Charles W., St. Denis, Md.
Sutton, Nellie, 75 E. High street, Detroit, Mich.
Swain, Helen Jasper, Wheaton Seminary, Norton, Mass.

Sweeney, M. F., 641 King street, Pottstown, Pa.
Talbot, Mary Eloise, 28 Lincoln street, Boston, Mass.
Talbot, W. T., M.D., Wellesley, Mass.
Taylor, Frederic W., M.D., 1735 Massachusetts avenue, Cambridge, Mass.
Taylor, Henry Ling, M.D., 60 W. 55th street, New York City.
Taylor, Mabel H., 300 Elizabeth street, New York City.
Taylor, S. May, McLean Asylum, Waverley, Mass.
Thayer, Ada F., 503 E. Willow street, Syracuse, N. Y.
Thomas, Edna, 29 May street, Worcester, Mass.
Thomas, Felicia H., Westtown, Pa.
Thomas, May, 300 N. Monroe street, Muncie, Ind.
Thomas, W. Scott, Principal of High School, Merced, Cal.
Thompson, H. C., M.D., 229 W. 52d street, New York City.
Thompson, William Grant, U. S. Indian School, Carlisle, Pa.
Thornley, James W., Narragansett Machine Co., Providence, R. I.
Thurber, Charles H., Editorial Department, Ginn & Co., 9 Tremont place, Boston, Mass.
Toepel, Theodore, M.D., 1105 Eng. Am. Building, Atlanta, Ga.
Tooley, R., Brockport, N. Y.
Tower, Bessie, 18 Myrtle avenue, Auburndale, Mass.
Towne, Lillian M., 89 Surrey street, Brighton, Mass.
Towne, S. R., M.D., 22 Continental Building, Omaha, Neb.
Townsend, George H., 24 Clinton street, Detroit, Mich.
Trask, Miss H. E., 2046 Park avenue, Philadelphia, Pa.
Treadwell, Flora G., 76 Lafayette avenue, Brooklyn, N. Y.
Treat, Blanche E., High School, 17th and Spring Garden streets, Philadelphia, Pa.
Trowbridge, Janette, State Normal School, Trenton, N. J.
Truslow, Walter, M.D., 168 Clinton street, Brooklyn, N. Y.
Turner, Albert, 481 5th avenue, New York City.
Turner, Anita J., 313 Spruce street, N. W., Washington, D. C.
Turner, Grace B., 45 Ascension street, Passaic, N. J.
Tuttle, Edwin H., 217 Mansfield street, New Haven, Conn.
Tyson, John M., Y. M. C. A., Warren, Pa.
Underhill, Dorothy, 127 Pembroke street, Boston, Mass.
Valdés, F. P., 10 St. Philips street, Charleston, S. C.
Velte, Charles F., Hill School, Potsdam, Pa.
Verbeck, Colonel, St. John's School, Syracuse, N. Y.
Vinton, Emma A., Atlantic, Mass.
Voorhees, J. Martin, M.D., 291 DeKalb avenue, Brooklyn, N. Y.
Waddington, Anna F., 1829 Madison avenue, Baltimore, Md.
Wagner, Miss Margaret M., Wilson College, Chambersburg, Pa.
Walker, Alice M., 307 York street, New Haven, Conn.
Walker, Florence C., 1403 Chartiers street, Allegheny City, Pa.
Walker, Isabel F., State Normal School, Whitewater, Wis.
Wallace, George W., 54 W. 120th street, New York City.
Wallin, Mathilda K., M.D., 78 Park avenue, New York City.
Walmsley, May, 307 N. State street, Ann Arbor, Mich.
Walter, Max J., Ph.D., 1516 Green street, Philadelphia, Pa.
Walton, Mrs. Elizabeth Ridgely, 2005 G street, N. W., Washington, D. C.
Ward, Alice G., 80 Crescent avenue, Newton Centre, Mass.
Wardwell, Margaret S., 9 Lowell street, Cambridge, Mass.
Warner, Elma L., 618 Willoughby avenue, Brooklyn, N. Y.
Warren, M. Alice, 320 Otis street, West Newton, Mass.
Waterman, Grace L., B. N. S. Gymnasium, Boston, Mass.
Webber, S. G., M.D., West Newton, Mass.
Webber, Sarah Southworth, 279 Highland street, West Newton, Mass.
Wegener, Albert B., Y. M. C. A., Rochester, N. Y.

Wehr, Charles J., 203 Adelbert street, Cleveland, O.
Weir, Mary Wallace, 40 Round Hill, Northampton, Mass.
Weiss, Philip J., University of Notre Dame, Notre Dame, Ind.
Wells, Mrs. Anna D. McNair, Auburndale, Mass.
Wells, Mrs. Joseph Albert, 74 Henry street, Toronto, Canada.
Wells, Sarah C., 129 N. Ludlow street, Dayton, O.
Welzmiller, Louis R., M.D., 318 W. 57th street, New York City.
Wentworth, Mrs. Sarah H., 65 W. 126th street, New York City.
Wentz, Etta Lansing, 99 Eagle street, Albany, N. Y.
Wessel, Maude A., 201 St. Botolph street, Boston, Mass.
West, Emma Carter, 9 Wilson street, Winchester, Mass.
White, John G., Central Y. M. C. A., Chicago, Ill.
White, Josephine P., Quittecas Farm, N. Rochester, Mass.
White, May, 35 Nash street, New Haven, Conn.
Whitney, Jessie A. 514 Erie street, Port Huron, Mich.
Whitridge, Grace B., 143 Pleasant avenue, St. Paul, Minn.
Whittemore, Ruth, 26 Mather street, Dorchester, Mass.
Whittier, F. N., M.D., Bowdoin College, Brunswick, Me.
Wickwire, Lila J., 103 N. Main street, Farmington, Ill.
Wiggins, Alta, 289 Delaware avenue, Buffalo, N. Y.
Wilde, Harriet, 102 W. 84th street, New York City.
Wilder, Gertrude, 91 Clay avenue, Muskegon, Mich.
Williams, Charles M., 36 Ransom street, Muskegon, Mich.
Williams, Irving D., 318 W. 57th street, New York City.
Williams, Sophia Wells, 2208 Gilbert avenue, Cincinnati, O.
Wilson, Agnes W., 59 Livingston street, Brooklyn, N. Y.
Wilson, Jennie B., 54 Langdon street, Cambridge, Mass.
Wilson, M. Caroline, 143 Main street, Watertown, Mass.
Wingert, H. Shindle, M.D., Temple College, Broad and Berks streets, Philadelphia, Pa.
Winter, Magnus F., 401 Palisade avenue, Jersey City, N. J.
Winton, Florence S., 695 Cass street, Milwaukee, Wis.
Wise, F. B., Y. M. C. A. Training School, Springfield, Mass.
Wittig, R. L., 2904 Avenue L, Galveston Tex.
Woll, Frank A., 20 E. 23d street, New York City.
Wollaston, Caroline M., 770 Euclid avenue, Cleveland, O.
Wollaston, Mary A., Swarthmore, Delaware Co., Pa.
Wood, Jennie, 307 York street, New Haven, Conn.
Wood, Thomas D., M.D., Teachers' College, 120th street, New York City.
Woodward, Katherine. 129 Beaufort street, Chelsea, S. W., London, Eng.
Worther, Carrie, 103 Youle street, Melrose, Mass.
Wright, Elizabeth A., Radcliffe College, Cambridge, Mass.
Wright, Elizabeth M., 26 N. Church street, Cortland, N. Y.
Wright, John H., Perkins Institute for the Blind, South Boston, Mass.
Wright, Louise, 723 Elm street, New Haven, Conn.
Wright, Lucy E., Perkins Institute for the Blind, South Boston, Mass.
Young, A. G., M.D., Augusta, Me.
Young, Elizabeth, 83 St. Stephen street, Boston, Mass.
Young, Evaline, Girls' High School, 2046 Park avenue, Philadelphia, Pa.
Young, H. Alfred, M.D., Scranton Institute, Scranton, Pa.
Zapp, Karl, M.D., 681 Woodland avenue, Cleveland, O.
Ziegler, Carl, 2362 Wheeler street, Cincinnati, O.
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